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Medical and Dental Aspects of Oral Malignancy

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THE dentist's position of responsibility in the recognition of *oral* cancer is similar to that of the general practitioner of medicine in recognition of *extraoral* cancer. As a rule, the dentist sees his patients more often than the family physician. Since approximately 7,500 Americans die annually from cancer of the mouth, lip, tongue, and jaw, reasonable suspicion, early diagnosis, and effective treatment should result in an annual saving of as many as 6,000 potential oral cancer victims. The dentist must be given and accept the first line of responsibility for suspicion and diagnosis. It is the dentist who is particularly trained in diagnosis of oral lesions. The physician should find the dentist a useful and capable ally in the war against this one segment of cancer.

Cancer may arise on the labial or buccal mucosa, palate, tongue, gingiva, or within the jawbones or the salivary glands. Almost all malignant tumors of the oral mucosa are epidermoid carcinomas (squamous cell). Other malignant tumors of the oral cavity are adenocarcinomas, mixed tumors of salivary gland types, malignant ameloblastomas, and the various types of sarcomas. No age group is free from threat of cancer. It is true that oral cancer, as other cancers, is more prevalent in older individuals, but even children may be victims of malignant tumors.

Because of his responsibility, the dentist must inspect carefully periodontal pockets, crypts of third molars, interdental areas, the floor of the mouth, the base of the tongue, and the faucial pillars, as well as the more accessible regions of the mouth.

Since the laryngologist frequently is not consulted until subjective symptoms occur and the dentist sees his patient more often, it would be beneficial if the dentist noted the condition of the pharynx and tonsils and advised patients to consult their physicians in instances where suspicious lesions are noted, in a manner similar to the practice of physicians who advise their patients with intraoral lesions to consult the dentist. Universal use of complete intraoral radiographic examinations can be of great value in detecting deep-seated cancers in their earlier stages.

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PRECANCEROUS LESIONS

So-called precancerous lesions include chronic fissures and ulcers, benign tumors, keratoses (horny growths), and leukoplakia. In most cases, these do not develop into cancer but their presence indicates irritation. Discover the cause of the irritation and remove it for, if the cause is not removed, cancer may develop.

Leukoplakia (Figure 1) has long been recognized as a possible precursor of cancer but should not be considered as a cause of cancer. This condition is usually a sign of irritation and the persistence of the same irritation that caused leukoplakia, which is an overgrowth of the horny layer of the epidermis (hyperkeratosis), may continue on to initiate cancer. If leukoplakia is to be considered as a precancerous lesion the definition should limit diagnosis to those lesions showing dyskeratosis, microscopically.[3] Leukoplakia must be differentiated from traumatic lesions of check chewers, Fordyce spots, lichen planus, and drug burns[7] (Figures 1, 2, and 3).

GENERAL ETIOLOGIC FACTORS

Many factors apparently associated with the development of oral malignancies are known. There

HAMILTON B. G. ROBINSON

seem to be a number of predisposing causes such as heredity, various deficiencies, use of tobacco, syphilis, and the three types of irritation: traumatic, thermal, and chemical. It is apparent that some individuals have mucous membranes which are more sensitive to these irritants than are those of others.

Various deficiency states, such as anemia, vitamin (certain members of the B complex), and specific sex hormones, may be factors in cancer although their roles have not been well established. Specifically, Plummer-Vinson syndrome has been associated with carcinoma of the mouth in women. However, since cancer of the mouth of women is relatively rare in this country, as is Plummer-Vinson syndrome, its importance in oral cancer in America is questionable.

Smoking once was widely indicted as a primary cause of cancer but increased smoking by women has not produced the expected increase in that sex. Nevertheless, in many instances, the use of smoking or chewing tobacco or snuff may be an important predisposing factor.

Trauma, which could have been prevented, and the resulting inflammation (as caused by rough pipe stems, repeated accidental abrasions, and so forth) may be contributing causes of oral cancer. In addition, thermal irritations caused by exposure to heat, cold, or excessive sunlight (farmers, sailors, and soldiers) and chemical irritations can be blamed. Perhaps, however, the most important and active etiologic factors lie in the dental apparatus and supporting tissues.

DENTAL ETIOLOGIC FACTORS

By eliminating the irritating dental conditions which are frequently precursors of cancer, malignancy often may be prevented. These irritations are numerous and varied: teeth roughened by attrition, abrasion, or caries (Figure 4); crowns and fillings with overhanging margins (Figure 5); bridges or partial dentures with ill-fitting clasps that impinge on the soft tissues; rough, broken, or missing porcelain facings; complete or partial dentures that have outlived their usefulness and fit (Figures 6 and 7); gingival and periodontal diseases; and malposed and ectopic teeth.

Mouth cleanliness also seems to be a factor, for epidermoid carcinoma is more prevalent in dirty, ill-kept mouths (Figure 10) than in those that are clean, well cared for, and hygienic.

Tumors often arise in edentulous mouths (Figures 6 and 7) because a loose or improperly balanced denture may irritate the underlying mucosa and aid in causing epulis fissuratum, papillary carcinoma or, through ulceration, permit invasion of the jawbone and resultant carcinogenic effect.

Chronic periodontal disease also may supply the irritating tumor-forming factor. Deep within the pockets around teeth or within crypts under third molar flaps, there may be sufficient stimuli from bacterial fermentation and putrefaction to promote tumorous changes which are not discernible until the tumor is too far advanced to trace etiologic factors.

CANCER OF THE LIP

Cancer of the lip (Figure 11) develops at a site easily observable by the patient, physician, or dentist. In spite of this, almost one out of every 100 tumor deaths is due to cancer of the lip. Strictly speaking, the term cancer of the lip should be limited to those cancers which are located in the red area of the lip, i.e., between the cutaneous border and the line of closure of the lips.[2] The lesion

usually grows slowly and can be cured in 95 per cent of cases in which early diagnosis is made. Cancer of the lip is relatively rare in women, and in both sexes before age 25. This does not mean, however, that it never occurs in such individuals, for a surprisingly large number of carcinomas were observed on the lips of young soldiers.[2] About 95 per cent of all lip cancers occur on the lower lip.

Clinical appearance—This varies so much, in its early stages, that the cancer may be indistinguishable from the lesion which preceded it. Early lip cancers usually appear as grayish-white, elevated, warty (verrucous) growths; as eroded lesions with hardened borders; or as moist scaling areas of inflammation.

In its early stages, lip cancer must be differentiated from the more common herpes, verruca vulgaris, burns, traumatized lesions, chancre or mucous patches of syphilis, leukoplakia, benign tumors, mucous cysts, and tuberculous ulcers.

Diagnosis—Biopsy is the important aid in establishing diagnosis and, in most instances, is absolutely necessary. With any doubtful lip lesion a biopsy should be made.

INTRAORAL CANCER

Were it not for biopsy and the subsequent microscopic examination of this material, the recognition of oral cancer frequently would be most difficult. The lesion often begins with a local area of hyperkeratosis (Figure 4) which may persist for a long time before induration is evident. Therefore, any hyperkeratosis (Figures 1 and 4), swelling (Figures 5, 6, 7, 12, 13, 15, 17, 18, and 24), papillary growth, or chronic ulcer (Figures 7 and 10) should be viewed with genuine suspicion.

Syphilitic, tuberculous, and actinomycotic (Figures 13 and 14) lesions may resemble carcinoma and vice versa. Chronic inflammation with granulation tissue or other hypertrophic reactions (Figure 6) may also appear as highly malignant tumors.

Any of the benign lesions may simulate malignant tumors. Some of these benign tumors and cysts of the oral cavity may even exhibit characteristics of persistency and recurrency which require treatment as though they were true cancers. Ameloblastomas (Figure 18), for example, may grow between bone trabeculae (Figures 19 to 22) and defy enucleation.[6] Subsequent growth from cells left at operation may become more anaplastic (cells revert to a more embryonic type) and, after repeated operations have been performed, may even metastasize.[10]

Intraoral epidermoid carcinomas (Figures 7 to 10) are relatively slow-growing and are more likely to invade adjacent structures than to metastasize to distant parts. The regional lymph nodes may become involved but in most cases that are diagnosed early, these nodes may be removed. At least 60 per cent of the cases in which the original lesion is under 1 cm. (about ⅜ inch) in diameter may be cured. Lesions less than 2 cm. in diameter show from 12 to 31 per cent higher five-year survival rates than "all comers."[4] It should be remembered that intraoral tumors 2 cm. in diameter are not small.

The more malignant osteogenic sarcomas (Figures 24 to 27) and lymphosarcomas (Figure 28) fortunately are found relatively rarely in the oral region.

The mixed tumors rarely metastasize and only about 25 per cent are malignant.

The clinical appearance of intraoral cancer is deceiving, for it varies from pustules to verrucous growths and from pimples to open ulcers. For example, chronic inflammation with granulation tissue or other hypertrophic reactions (Figure 6) may appear as highly malignant tumors.

BIOPSY

Any persistent lesion of the oral cavity which cannot be readily diagnosed as nonmalignant should be examined by biopsy. When this is done properly, there is no danger of spreading the cancer. Living cells should be removed surgically from the growing edge of the lesion and this piece of tissue should be at least 5 millimeters in diameter. The excised tissue should be placed immediately in 10 per cent formalin or in other suitable fixative and forwarded to the pathologist for microscopic examination. The oral pathologist is especially trained for this work.* In many instances, such an examination (Figures 14, 23, 27, and 31) is the only reliable means of differentiating between benign and malignant neoplasms.

RADIOGRAPHIC APPEARANCE

Although biopsy may provide the final proof of malignancy there will be many cases in which

*The American Board of Oral Pathology, established in 1948, gave its first examination in June, 1949.

radiographic evidence will play a significant part. Such evidence can assume the highest importance for there will be times when a radiolucent area deep within the jaw may be the only symptom of cancer.

Carcinoma, when it involves bone, presents a bony area with a fuzzy, irregular, diffuse outline and a worm-eaten appearance. The roots of involved teeth will be eroded and "spiked," and there will be loss of trabecular detail with bizarre bone patterns (Figure 16, left and right). There is also apt to be an appearance of erosion, especially if the alveolar ridge is involved (Figures 8 and 9).

Osteogenic sarcoma will also disclose, radiographically, a loss of the normal bone pattern and a spiking of the roots (Figure 25).

Lymphosarcoma is primarily a sarcoma of the soft tissues. Therefore, radiographic interpretation depends upon changes brought about after the bone is involved. These can take the form of spreading and destruction of bone accompanied by widespread displacement of the teeth (Figure 28).

Ameloblastoma will disclose large and small, somewhat spherical, radiolucent areas (Figures 19 to 22). Its lobulated appearance is somewhat characteristic (Figures 20 and 21), although the growth may, at times, assume a size that almost destroys this appearance (Figure 22) and again it may be unilocular. Any radiolucent area in the jaw that presents a lobulated or trabeculated appearance should be suspected of being an ameloblastoma.

Giant cell tumor usually presents a roughly spherical or ovoid appearance with small lobulations. The margin is fairly well demarcated (Figure 29).

Cysts disclose areas of marked radiolucency, usually of more or less spherical shape with well defined peripheries (Figure 30).

Other types of radiolucencies and radiopacities

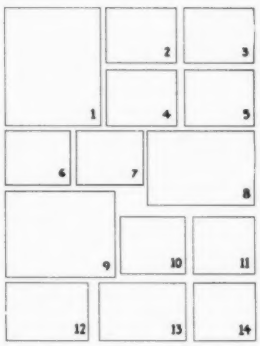


Figure 1. Leukoplakia of buccal mucosa in elderly patient. The lesion is white, opaque, and rough.

Figure 2. Lichen planus on buccal mucosa of young man. The lesion is smooth, pearly bluish-white, reticulated, and painless. Lichen planus was not observed extraorally. The oral lesions increased with gastric distress at times of nervous tension.

Figure 3. Irregular, traumatized lesion of cheek biting. The surface is ragged and the borders irregular. It is white, tender, and the epithelium can be peeled or teased off readily.

Figure 4. Epidermoid carcinoma with edges firm and indurated. Biopsy made possible this early diagnosis.

Figure 5. Osteofibroma at area irritated by improperly constructed bridge. Clinical diagnosis of epulis was correct, as this term is used for any benign tumor on the gingiva.

Figure 6. Epulis fissuratum or benign hypertrophy resulting from ill-fitting denture.

Figure 7. Advanced epidermoid carcinoma on mandibular ridge. See Figures 8 and 9.

Figure 8. Radiograph of edentulous mandible with verrucous carcinoma. Note erosion of alveolar ridge. Same patient as in Figure 7.

Figure 9. Radiograph of operative specimen of case shown in Figure 8. Postoperative radiographs are valuable supplements in making final diagnosis, for ascertaining if the limits of the growth have been reached in partial resection, and for teaching purposes.

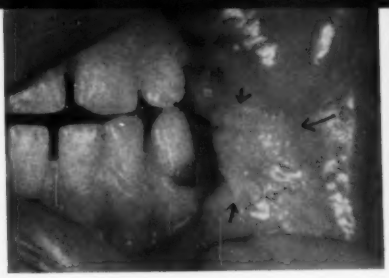
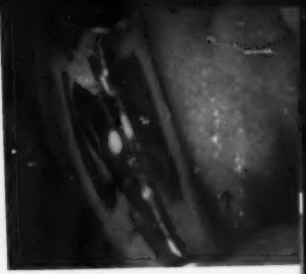
Figure 10. Epidermoid carcinoma extending from maxillary ridge over palate. Note the lack of dental care and blackened, rough tooth remnants.

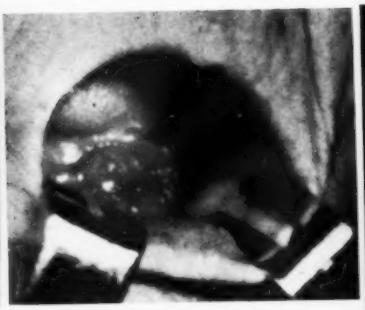
Figure 11. Advanced epidermoid carcinoma. Delay in diagnosis has reduced possibility of successful treatment.

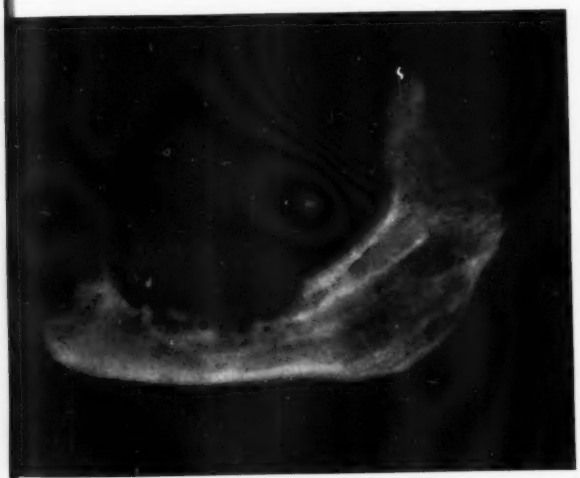
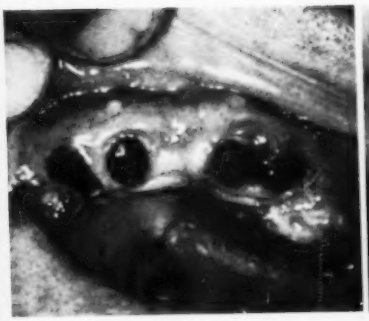
Figure 12. Epidermoid carcinoma diagnosed at the important early stage as that seen in Figure 4.

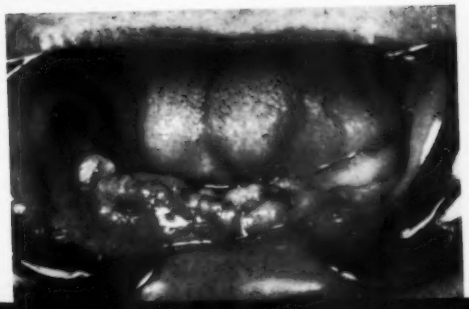
Figure 13. Area of granulation tissue at edges of extraction wound. Any such material should be examined on removal by an oral pathologist. Biopsy of such a case showed actinomycosis (see Figure 14).

Figure 14. Actinomyces israeli discovered in biopsy from region such as seen in Figure 13.





will be encountered which must be interpreted[8] (Figure 32).

PHOTOGRAPHY

While it is well recognized that taking a black-and-white or color photograph of an oral lesion has considerable value for teaching purposes, it is not so well appreciated that photography can be used to a certain extent as a diagnostic aid. For example, if a photograph is made of a suspicious oral lesion on discovery and, later, periodic photographs of the same scale size are made of this lesion, a comparison of the two will enable the diagnostician to determine accurately the rate of growth of the lesion and to differentiate slow-growing neoplasms.

DIAGNOSIS

Interpretation of both clinical and radiographic findings is often difficult. Erosive carcinomas, for example, may simulate, both clinically and radiographically, benign tumors, odontomes, cysts, or inflammations such as osteomyelitis.[8,10] The complex picture of oral cancer with slow-growing verrucous types, more erosive forms, and deep intraosseous growths makes biopsy imperative for any persistent oral lesion that cannot be diagnosed otherwise with assurance. It is unwise to make an attempt at diagnosis from clinical appearance alone. Both radiography and biopsy will help.

PREVENTION

The best known methods of oral cancer prophylaxis are: (1) maintenance of well-reconstructed mouths with good restorative dentistry; (2) neutralizing dental irritation by correction and removal of all sharp edges of teeth, cavities, or fillings; (3) rendering necessary periodontal therapy; (4) adequate treatment of inflammatory diseases; (5) advising antisyphilitic treatment when lues is present; (6) treatment and correction of orthodontic anomalies; (7) recognition and correction of vitamin and hormonal deficiencies; (8) advising heavy tobacco or snuff users of early mucous membrane changes, and (9) teaching correct oral hygiene and insisting on maintenance of a clean mouth.

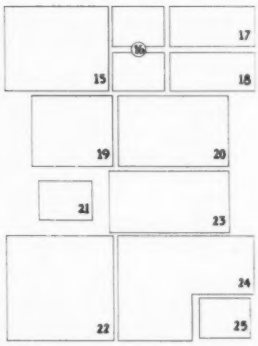


Figure 15. Adenocarcinoma discovered in routine radiographic examination.

Figure 16. Radiograph of the adenocarcinoma seen in Figure 15 (top). Note "spiking" of roots and "snowflake" appearance, instead of normal trabeculation. Bottom: Radiograph of bicuspid area of same case. Again note "spiking" of roots and loss of normal trabeculation at distal.

Figure 17. Giant cell tumor in mouth of 5-year-old boy. Traumatization by mandibular teeth could promote malignant change. Clinically this tumor is an epulis (benign tumor of gum).

Figure 18. Ameloblastoma present in mandible of 60-year-old woman for at least fifteen years.

Figure 19. Occlusal radiograph of mandible of patient seen in Figure 18. Note the honeycombing caused by proliferation between trabeculae of bone.

Figure 20. Lateral jaw radiograph of ameloblastoma of mandible. The lobulated borders and daughter cyst, characteristic of this dental tumor, are apparent.

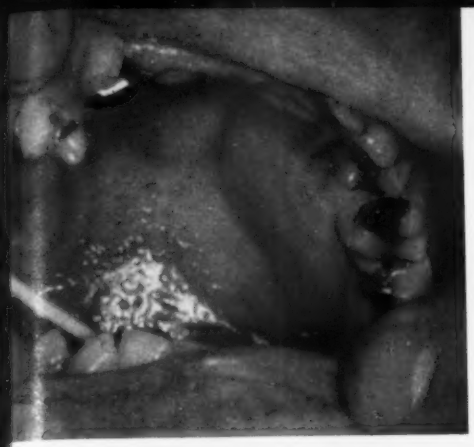
Figure 21. Periapical radiograph of part of the region seen in Figure 20. Note characteristic trabeculation of ameloblastoma.

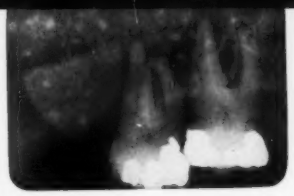
Figure 22. Large ameloblastoma of mandible of thirty years' duration. The size of this tumor explains the value of early detection and removal.

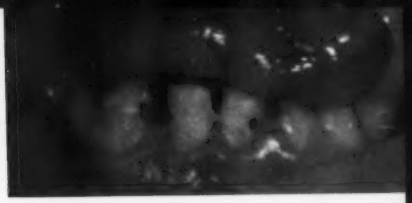
Figure 23. Biopsy from solid ameloblastoma. The smaller strands resemble the dental lamellae and the larger follicle shows tall ameloblast-like cells, stratum-intermedium-like cells, and stellate cells arranged to mimic the enamel organ.

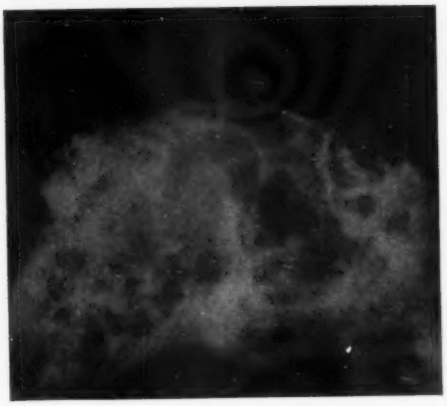
Figure 24. Metastasis from osteogenic sarcoma (chondromyxosarcoma) of leg of 12-year-old boy. This intraoral tumor was firm and movable. It was neither painful nor tender.

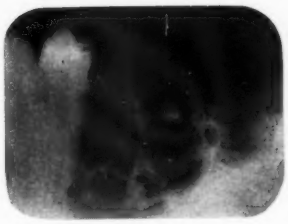
Figure 25. Periapical radiograph from the region seen in Figure 24. The loss of normal bone pattern is seen about the second molar and there is a spiking of the roots. This tooth was loose—often an early symptom of malignancy.

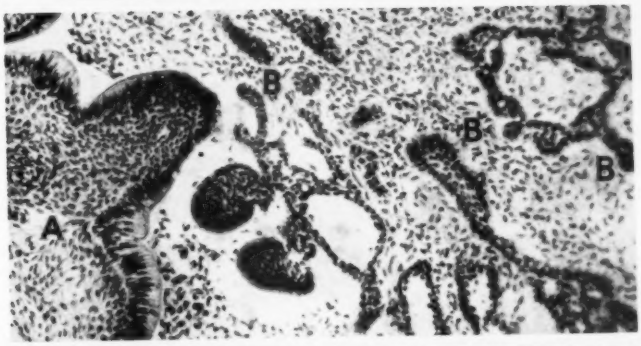








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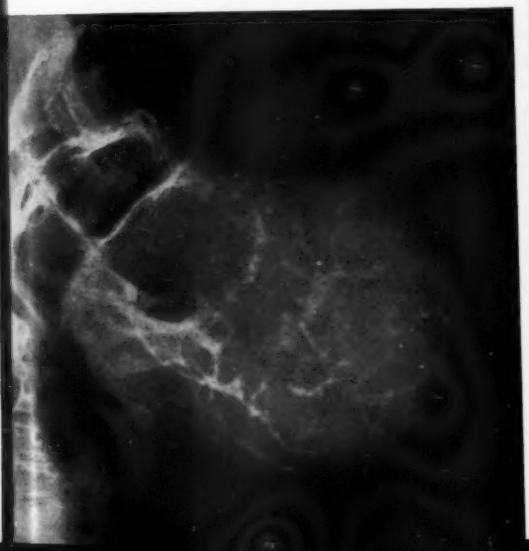


Figure 26. Metastasis to shoulder of patient seen in Figure 24. This occurred about one year after original leg symptoms and about two months after first oral symptoms of this terminal case.

Figure 27. Biopsy from tumor seen in Figure 24 showing disorderly growth, variation in cell size and form, and area of cartilage-like growth.

Figure 28. Radiograph of lymphosarcoma of maxilla of a 3-year-old child. Note wide displacement of teeth.

Figure 29. Periapical radiograph of central giant cell tumor in mandibular left cuspid and bicuspid area. The symptoms were suggestive of pain from occlusal trauma. Patient was 18-year-old girl.

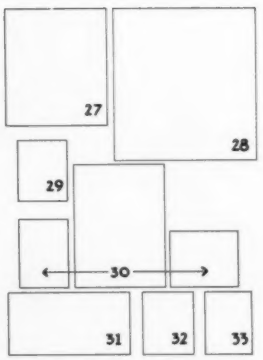
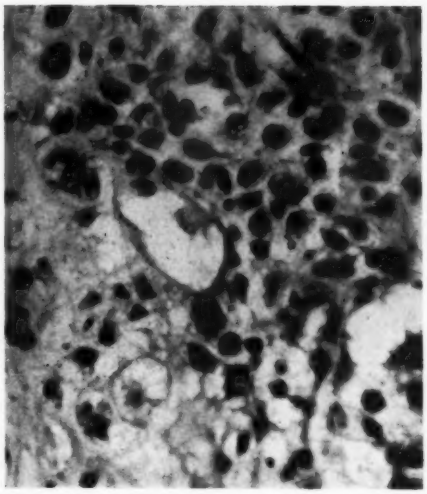


Figure 30. *Left*: Periapical radiograph of periodontal cyst at apex of maxillary right lateral incisor. Such radiolucencies may be caused by large granulomas, or by tumors as well as cysts. Clinical and microscopic examination of tissue removed is important to aid radiographic diagnosis. *Center*: Occlusal radiograph of globulomaxillary cyst. This developmental cyst is differentiated by its pear shape and spreading of the roots of the maxillary cuspid and lateral incisor (occasionally between central and lateral incisors) which are vital to pulp tests. *Right*: Periapical radiograph of dentigerous cyst at crown of mandibular third molar. The radiograph differentiates this from pericoronitis or neoplasm. The removed material should be examined carefully to supplement radiographic examination.

Figure 31. Proliferating epithelium from the wall of a periodontal (dental root) cyst. The tendency to change toward columnar form in the peripheral cells can be noted. A change to a true neoplasm is quite possible in such lesions.

Figure 32. Periapical radiograph of a compound composite odontome (tumorous anomaly). These anomalies must be differentiated from the true neoplasm. The radiograph is a valuable tool for this purpose.

Figure 33. Periapical radiograph showing destruction of teeth within eighteen months of heavy, deep radiation for tumor of neck.



The dentist must be aware of the appearance of oral cancer and must diligently examine all parts of the mouth by visual, manual, radiographic, and laboratory methods. The physician must be aware of the need for regular oral examination by his dental colleague. Detection of malignancy in an early stage involves both visual and mental functions—seeing and recognizing the condition.

Since cancers often arise in edentulous mouths, it is important that denture patients be seen at regular intervals for examination of the tissues for swellings, ulcers, hyperkeratosis, and bone destruction. Loose or improperly balanced dentures should be corrected or remade.

Individuals should be taught correct methods of oral hygiene and advised that the constant use of astringent mouth washes produces unnatural drying of the mucosa. The practice of recommending mouth washes for therapy of undiagnosed oral lesions should be discouraged.

TREATMENT

Modern cancer therapy utilizes surgery and radiation therapy. The treatment of cancer is as highly specialized as the treatment of oral disease. In certain instances surgery is the method of choice; in others, radiation therapy is preferable; and in still others, the two methods are combined. Radiation therapy includes the use of radium, radium gases, x-rays, and radioactive isotopes. It is important that the patient be referred to a competent physician or surgeon by the dentist who assumes the duty of diagnosis as early as possible. Caustics should not be used on suspicious lesions as they may give a false sense of security while the tumor is infiltrating or metastasizing.[1] The progress of an oral cancer may sometimes be quite rapid, at times almost explosive, and for this reason a few days' delay may reduce the patient's opportunity for cure.

Periodontal structures that recently have been subjected to irradiation are not amenable to operative procedures. All dental treatment should be completed before radiation therapy is started. After heavy, deep irradiation, the teeth often disintegrate in one or two years[5] (Figure 33). The exact cause of this phenomenon is not known, but it does not appear to be due to the direct effect on the teeth for lead shields over the teeth will not protect against it. Because of the destructive dental reaction following x-ray therapy, it is suggested that all teeth be removed before deep and heavy radiation therapy of the face or neck. The possibility of saving a life, in such a case, is far more important than saving teeth. The teeth may be replaced by artificial dentures.[5,9]

Don't temporize with cancer. Every suspicious swelling, ulcer, papillomatous growth, radiolucency, or roughness in the oral region calls for immediate positive diagnosis and adequate treatment.

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Cholecystostomy in the Treatment of Acute Cholecystitis

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INTRODUCTION

ACUTE cholecystitis is such a common disease that its importance as an acute surgical problem does not need to be stressed. Each patient must be considered individually and an early decision must be reached as to whether immediate surgical intervention or a period of observation is indicated. The optimum time for operation would appear to be within the first forty-eight hours after the onset of symptoms but frequently the patient may not be seen until two or three days after the onset of symptoms when marked inflammatory edema, gangrene, pericholecystic abscess, or even rupture has occurred.

There is a general agreement that cholecystectomy is the preferable procedure when acute inflammation has occurred in the gallbladder, for then the major portion of the pathologic tissue and obstructing stones are removed. In the extremely ill or debilitated patient or when the vital biliary structures already have been obscured by the inflammatory process so as to make a proper dissection hazardous, thus imposing an unwarranted risk on the patient, cholecystostomy is the safest surgical procedure and in most instances will offer immediate relief to the patient. Drainage of the acutely inflamed gallbladder under such circumstances may then be a lifesaving procedure.

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HISTORICAL DATA

The first authentic operation on the gallbladder was performed eighty-one years ago by J. S. Bobbs[1] of Indianapolis. He opened the abdomen of a female patient on June 15, 1867, and unexpectedly found gallstones which he removed. The patient made an uneventful recovery and was alive and well thirty-two years later. Credit for the first premeditated operative procedure on the gallbladder, however, must go to J. Marion Sims[2] who, on April 18, 1878, did a cholecystostomy on a jaundiced female patient who died on the eighth postoperative day. Postmortem examination revealed no peritoneal leakage or infection. The patient died from hemorrhage from the gums and the intestinal tract, a situation which was presumed to be due to the complications arising from a stone in the common hepatic duct. Sims coined the word "cholecystotomy" from three Greek words meaning "gall," "bladder," and "incision." Then on July 15, 1882, Carl Langenbuch[3] performed the first cholecystectomy recorded in medical literature. His patient survived the operation without untoward incident.

In 1899, the late W. J. Mayo[4] reported on a series of 105 operations on the biliary tract carried out during the previous eight years. Cholecystostomy was done in 72 (68.6 per cent) of this group, with 2 deaths. In 7 of these patients symptoms persisted that were referable to the gallbladder and in all 7 the failure apparently was due to obstruction to drainage through the cystic duct. He pointed out that the obstruction was usually due to a stricture caused by an ulceration from the prolonged lodgement of a stone in the cystic duct and at times also due to angulation of the duct. He explained that colicky pains attended the forced passage of secre-

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tions by the mucous membrane of the gallbladder. Even at that early date, he emphasized that cholecystectomy should be employed more frequently.

In 1933 Judd and Phillips[5] reported 508 cases of acute cholecystitis in which operation had been performed. In this group there were 89 cases (17.5 per cent) in which a cholecystostomy was done and 419 in which the gallbladder was removed. These figures illustrate quite well the modern trend toward complete removal of the gallbladder for acute inflammatory disease whenever possible.

In 1943 Zollinger and Cutler[6] reported on 146 patients who had 156 surgical procedures for acute cholecystitis. Cholecystostomy was carried out in 28 persons (19.3 per cent). Three patients died after cholecystostomy, giving a mortality rate of 10.7 per cent. The mortality rate for the surgical procedure in the entire group of 146 patients was 2.6 per cent. Complications developed in an appreciable number of cases (24 per cent), the majority of which were related to the pulmonary system. Zollinger and Cutler expressed the opinion that the mortality figures had improved owing to the increased use of cholecystostomy.

Eliason and Stevens[7] reported 135 cases of acute cholecystitis in 1944. In 92 (68 per cent) cholecystostomy was the procedure of choice and the hospital mortality rate was only 2.1 per cent. The points were emphasized that a judicious choice of procedure was paramount, that this choice would have to be governed largely by the surgeon's own experience as well as the patient's general condition and that it would be far better to stop with a cholecystostomy than to attempt a cholecystectomy which would impose a prohibitive risk. These observers concluded that most persons who had been relieved for a year following cholecystostomy alone had a very good chance of permanent relief.

The report by Glenn and Heuer[8] in 1946, in which 527 cases of acute cholecystitis were analyzed, emphasized that cholecystostomy should be reserved for extremely debilitated patients and patients who were very ill. Cholecystostomy was done in 67 (12.7 per cent) of this group. Glenn and Heuer felt that whenever gangrene and perforation with peritonitis were present, cholecystostomy would be the preferable type of operation. These authors noted that the mortality rate in the older age group (over 50 years of age) was almost five times that of the younger group because of the frequently associated degenerative diseases such as arteriosclerosis, hypertension, and diabetes.

REVIEW OF DATA ON 103 CASES

In order to determine how well such patients have progressed after a cholecystostomy for acute cholecystitis had been done, we have followed the course of 103 consecutive patients who underwent this operation at the Mayo Clinic from January 1, 1935, through December 31, 1942. This study was made after a period of five years had elapsed since the last cholecystostomy in this group had been carried out—an adequate period, we feel, to permit the majority of the complications of disease of the biliary tract to develop.

In this same eight-year period, the gallbladder was removed at the clinic in 455 instances for acute cholecystitis. The mortality rate for cholecystectomy during that same period was 2.9 per cent, 13 of 455 patients having died after operation. In the surgical treatment of acute cholecystitis, therefore, cholecystostomy was the procedure chosen by the surgeon in 18 per cent of the cases.

Age—The ages of the 103 patients varied from 12 to 89 years. The average age was 54.2. The majority of the patients (67.0 per cent) were over 50 years of age. Forty (38.8 per cent) of the 103 patients were over 60 years of age and 6 (5.8 per cent) patients were over 70 years of age.

Sex—It was surprising to note that the usual ratio of females to males with biliary disease was reversed in this series, for there were 58 males to

45 females. The altered ratio was more pronounced in the older age group, above 60 years of age, in which there were 24 males to 16 females. The explanation for this unusual distribution was not apparent.

Associated conditions—Cardiovascular disease, diabetes, and obesity predominated among the associated conditions which increased the patient's surgical risk. The conditions noted and the number of patients affected were as follows: cardiovascular disease 7, diabetes 7, obesity 5, duodenal ulcer 4, adenomatous goiter 3, and toxic nephritis 1.

Diagnosis—As pointed out frequently by the late W. J. Mayo, it is quite often very difficult to correlate the clinical with the pathologic progress in acute inflammatory disease of the gallbladder. This is especially true in the more advanced age group, in which impaired circulation and lowered resistance to infection undoubtedly play an important role. The differential diagnosis of acute appendicitis and acute cholecystitis in the aged is frequently difficult if not impossible. In this series there were 5 instances in which a preoperative diagnosis of acute appendicitis had been made. In 2 of these instances the 2 oldest patients in the series were affected. Acute appendicitis was diagnosed in 3 males aged 30, 80, and 89 years respectively, and in 2 females aged 12 and 63 years.

Cholecystic disease was diagnosed in all the remaining cases, although acute cholecystitis was specified in only 30. Subacute disease was specified in 10 cases.

Operative findings—Stones were found in the gallbladder in 94 (91.3 per cent) of the 103 patients. These were described as being impacted in the cystic duct in 30 (29.1 per cent). Stones were present in the common bile duct in 6 (5.8 per cent). No stones were found in 9 patients.

From the operative notes, which were compiled by 12 different surgeons on the staff of the clinic, the conditions of the gallbladder described and the number of times they occurred were as follows: gangrene 23, perforation 26, pericholecystic abscess 14, general peritonitis 2, acute empyema 22, cholecystocolonic fistula 2, primary carcinoma of the gallbladder 1, and primary carcinoma of the common duct 1.

The primary carcinoma of the gallbladder was a grade 3 adenocarcinoma (Broders' method). The primary carcinoma of the common hepatic duct originated at the juncture with the cystic duct and proved to be a grade 2 adenocarcinoma. Acute cholecystitis was associated in these 2 cases, hence palliative cholecystostomy was carried out in both instances. Acute cholecystitis was the surgical diagnosis in all instances and this was substantiated by biopsy of tissue from the gallbladder in 33 instances.

Associated findings—Jaundice was present in 13 patients (12.6 per cent). The common bile duct was explored in 9 of these 13 cases and stones obstructing the duct were found in 4. A primary carcinoma of the common bile duct was found in 1.

The common hepatic duct was explored also in 4 other patients who had no clinical evidence of jaundice, in 2 of whom stones were removed from the duct. There were therefore 13 patients (12.6 per cent) who had a choledochostomy done in addition to the cholecystostomy, in 6 of whom stones were found in the common bile duct.

Operative procedure—After the gallbladder had been emptied of pus or infected bile, an attempt was made to remove all stones, especially any that may have been blocking the cystic duct. A dressed tube was used in over 80 per cent of the cases. This was secured at the fundus of the gallbladder with two or three purse-string sutures. In the remaining cases a plain catheter or rubber tube was employed. Penrose drains were inserted beside the gallbladder and the latter was approximated as closely as possible to the peritoneum of the abdominal wall.

A partial cholecystectomy (fundusectomy) was performed in 8 instances. By this procedure actually most of the gallbladder was removed. In 3 of these 8 patients cholecystectomy was required because of subsequent symptoms referable to the biliary tract.

Pathologic findings—In the majority of cases, tissue was not obtained from the gallbladder for microscopic examination and drainage of the gallbladder alone was carried out. In 43 instances tissue was removed from the gallbladder for biopsy.

The following pathologic diagnoses were made: acute cholecystitis 33 instances, subacute cholecystitis 6, chronic cholecystitis 3, and primary carcinoma of the gallbladder 1.

Twenty-four patients had bacteriologic smears and cultures taken from the material contained within the gallbladder. The following results were noted: gram-negative bacilli 14 patients, streptococcus (faecalis?) 3, streptococcus (green-produc-

ing) 2, micrococcus 2, and negative smear or culture 3.

Antibiotic agents, such as penicillin or streptomycin, were not available at the time patients of this series were treated but at present cultures and smears from the acutely inflamed gallbladder would be most helpful in guiding the surgeon to more effective antibiotic therapy postoperatively and undoubtedly toward a decreased morbidity. Nickel and Judd[9] demonstrated several years ago that the majority of gallbladders that are surgically removed for acute or subacute cholecystitis contain pathogenic bacteria.

Postoperative course—The average stay in the hospital was 21.6 days. The patients on whom this average was calculated included 1 who experienced complications and stayed 104 days in the hospital but did not include the 6 patients who died postoperatively. Because of their initial severe illness, these patients remained in the hospital about one week longer than those who had clean abdominal operations carried out during the same period.

Mortality—Six (5.8 per cent) of the 103 patients died postoperatively. Five of these deaths were of patients over 60 years of age. Three of the 6 patients over 70 years of age died—a mortality rate for this small group of 50 per cent.

The age of the patient, the cause of death and the day of death of the patients who died postoperatively were as follows: patient aged 89 years, pulmonary edema, first postoperative day; aged 80, bronchopneumonia, fourth day; aged 75, bronchopneumonia, second day; aged 69, pulmonary embolism, ninth day; aged 61, exhaustion, nineteenth day, and aged 14, brain abscess, fourteenth day.

All these patients died before chemotherapeutic agents were employed extensively, the last one having died in 1940. It is possible and probable that with the aid of penicillin and streptomycin, the mortality rate would have been reduced to a considerable extent.

In addition to the above postoperative hospital deaths, there have been 17 deaths. Two of these deaths followed a palliative cholecystostomy for malignancy, seven and ten months respectively after operation. In another patient primary carcinoma of the common hepatic duct developed six years after the cholecystostomy. This was resected but the patient died the next day from an intraperitoneal hemorrhage. In another patient a cholecystoduodenal fistula developed two months after his cholecystostomy, which necessitated doing a cholecystectomy, but he died on the third postoperative day from extensive fat necrosis and shock. The remaining 13 patients of this group died from causes unrelated to the biliary tract.

We have divided the patients studied in this series into 2 groups: those above 60 years of age and those aged 60 years or below. Also, we have excluded, in the calculation of mortality rates, 2 of the 103 patients because each had a palliative cholecystostomy for a malignant condition of the gallbladder and common bile duct. Thus there were 38 patients above the age of 60 years and 63 patients aged 60 years or less.

Five of the 38 patients in the older age group (over 60 years) died postoperatively, giving a hospital mortality rate of 13.2 per cent. In view of the extremely poor condition of these 38 patients at the time of operation, cholecystostomy was undoubtedly a lifesaving operation in the majority of instances. It seems reasonable to assume that the more formidable procedure, cholecystectomy, would have increased the mortality rate considerably. Twenty-one of the 29 surviving patients whom we were able to follow-up, that is, 72.4 per cent of the known survivors of the group, progressed uneventfully without further biliary surgical treatment.

One of the 63 patients in the younger age group (60 years or younger) died postoperatively, giving a hospital mortality rate of 1.6 per cent. This patient was a girl aged 14 years who died, fourteen days after she had undergone exploration for acute cholecystitis, of a brain abscess secondary to peritonitis, subhepatic abscess and acute appendicitis. Thirtv-four of the 57 surviving patients whom we were able to follow-up, that is, 59.6 per cent of the known survivors of the group, progressed uneventfully without further biliary operations.

Subsequent biliary operations—Thirty patients had subsequent biliary operations. Twenty-eight of these were performed at the clinic and 2 were done elsewhere (Tables 1 and 2). Twenty-three of these patients were aged 60 years or less, whereas only 8 were over 60 years of age. Of the known followed patients, the percentage who required further biliary operations was 27.6 in the older age group and 40.4 in the younger age group.

Data on 29 patients who underwent further biliary operations at the clinic have been analyzed in detail. The great majority (72.4 per cent) were

TABLE 1

DATA ON 23 PATIENTS AGED 60 YEARS OR LESS WHO UNDERWENT FURTHER OPERATIONS ON THE BILIARY TRACT AFTER CHOLECYSTOSTOMY PERFORMED AT THE INDICATED AGE*

AGE, YEARS; SEX	INTERVAL, MONTHS	GENERAL CONDITION	SUBSEQUENT OPERATIONS					
			STONES IN		ASSOCIATED FINDINGS	TYPE OF OPERATION†	PATHOLOGY	REMARKS
			GALL-BLADDER	COMMON DUCT				
48 M	7	Jaundice and pain	Yes	Yes	Jaundice	1, 2, 3	Subacute on chronic	
	27	Pain		Yes	Pancreatitis (2+); ventral hernia	2, 3; repair hernia		Well 5 years postoperatively
57 F	60	Well 5 years, then pain	Yes	No		1	Chronic	Well 1 year postoperatively
29 M	3	Distress 2 months, postoperatively	No	No	Subhepatic abscess	1, 2	Subacute on chronic	
40 M	2	3 attacks of pain	No	No		1	Subacute on chronic	
57 F	24	Well 2 years, then pain	Yes	No	Ventral hernia	1, 2; repair hernia	Subacute on chronic	
56 M	72	Well 6 years, then pain	Yes‡	No		1	Acute, ulcerative on chronic	Well 4 years postoperatively
46 M	6	Mild pain 6 months, postoperatively	No	No	Hepatitis (2+)	1	Subacute on chronic	
29 F	3	Purulent, watery drainage persisted	No	No	Hepatitis (3+); pancreatitis (3+)	1, 2	Acute on chronic	Well 5 years postoperatively
46 M	24	Well 1 year, then pain	Yes‡	No	Pancreatitis (1+)	1	Subacute on chronic	
55 F	5	Well 5 months, then pain and mild jaundice	No	Yes	Hepatitis (1+)	1, 2, 3	Chronic	
51 M	7	Biliary fistula, white bile	Yes‡	No	External biliary fistula	1, 2	Chronic	
51 F	84	Well 2 years, then pain. Recurrent jaundice	No	Yes	Remnant of cystic duct	1, 2, 3	Chronic	
47 F	11	Cholecysto-colonic fistula first operation	No	No	Hepatitis (2+); pancreatitis (2+); cholecystocolonic fistula; cholecystoduodenal fistula	1, 2; close opening in duodenum and colon	Subacute on chronic	
51 M	36	Well 3 years, then pain	Yes	No	Hepatitis (2+); pancreatitis (2+)	1; appendectomy	Chronic; chronic appendicitis	
31 F	3	Mucous fistula persisted	Yes‡	No		1	Acute and subacute on chronic	
44 M	12	Persistent fistula. No stones first operation	Yes	No	Cholecysto-duodenal fistula, 4 mm.	1; close opening in duodenum	Subacute on chronic	Died third post-operative day, shock and fat necrosis
59 F	18	Jaundice	No	No	Cirrhosis	Cholecysto-duodenostomy		
	21	Jaundice	No	No	Pancreatitis (2+)	1; choledo-choduodenos-tomy	Subacute on chronic	Well 5 years postoperatively
44 F	24	Well 2 years, then colic	Yes‡	No		1, 2	Chronic	

TABLE 1 *(Continued)*

AGE, YEARS; SEX	INTERVAL, MONTHS	GENERAL CONDITION	SUBSEQUENT OPERATIONS					
			STONES IN		ASSOCIATED FINDINGS	TYPE OF OPERATION†	PATHOLOGY	REMARKS
			GALL-BLADDER	COMMON DUCT				
47 M	12	Well 4 months, then pain	Yes	Yes	Cholecysto-duodenal fistula, 1 cm.	1, 2, 3; close opening in duodenum	Subacute on chronic	
59 M	24	Well 2 years, then pain and jaundice	No	Yes		1, 2, 3; appendectomy	Chronic; chronic appendicitis	
59 F	72	Well 6 years, then pain and jaundice	No	No§		Resection of common bile duct	Adenocar-cinoma, grade 2	Died first post-operative day, shock and hemorrhage
25 F	60	Pain	?	?		1 (at home)		
25 F	?	?	?	?		1 (at home)		

*Twenty-one of the 23 patients were operated at the clinic the second time. The last 2 patients were operated elsewhere and details are not known.

†1, cholecystectomy; 2, exploratory choledochostomy; and 3, choledocholithotomy.

‡Stone impacted in the cystic duct.

§Primary carcinoma of the common hepatic duct encountered.

required to undergo further surgical treatment within two years after the cholecystostomy. Hence, if a patient progressed well for two years after his cholecystostomy, the chance that a further biliary operation would be required was much less—only about 1 in 4.

In this group who underwent further surgical treatment, jaundice was present in 9 patients or almost one-third of the group. An external biliary fistula had persisted in 6, and the surgeon found an impacted stone in the cystic duct in 3 of these 6. Cholecystoduodenal fistulas had developed in 3. Pancreatitis was noted by the surgeon in 9. Postoperative ventral hernia followed the original cholecystostomy in 2 and had to be repaired. In 1 patient a primary carcinoma of the common hepatic duct developed six years after cholecystostomy. The lesion was removed, but the patient died postoperatively.

SUMMARY AND CONCLUSIONS

Cholecystostomy was performed 103 times at the Mayo Clinic from January 1, 1935, through December 31, 1942, for acute cholecystitis, and a follow-up study of these cases has been carried out. No living patient was followed for less than five years from the time of cholecystostomy.

Forty, or 38.8 per cent, of the 103 patients were above the age of 60 years. The ages of the whole group varied from 12 to 89 years.

Six patients died postoperatively, giving a hospital mortality rate of 5.8 per cent. Above the age of 60 years the hospital mortality rate was 13.2 per cent while in those patients aged 60 or less the hospital mortality rate was only 1.6 per cent.

Nine patients could not be traced in spite of repeated attempts. The course of the remaining 88 is known.

Palliative cholecystostomy was done in 2 cases for inoperable malignant lesions of the gallbladder and of the common hepatic duct. In both cases the lesions were associated with acute cholecystitis.

Twenty-one (72.4 per cent) of the 29 traced patients who were above 60 years of age at the time of cholecystostomy got along well without further surgical treatment for five years or until the time of death. Thirteen were still alive and well, whereas 8 had died from causes that were unrelated to the biliary tract.

Thirty-four (59.6 per cent) of the 57 traced patients who were 60 years old or less at the time of cholecystostomy got along well without further surgical treatment for five years or until the time of death. Twenty-nine were alive and well whereas 5 had died in the meanwhile from causes which

TABLE 2

DATA ON 8 PATIENTS AGED MORE THAN 60 YEARS WHO UNDERWENT FURTHER OPERATIONS ON THE BILIARY TRACT AFTER CHOLECYSTOSTOMY PERFORMED AT THE INDICATED AGE*

AGE, YEARS; SEX	INTERVAL, MONTHS	GENERAL CONDITION	SUBSEQUENT OPERATIONS					
			STONES IN		ASSOCIATED FINDINGS	TYPE OF OPERATION†	PATHOLOGY	REMARKS
			GALL-BLADDER	COMMON DUCT				
66 M	84	Well 5 years, then colic	No	No	Scarred, rigid hepatic duct; pancreatitis (2+); jaundice (1+)	1, 2		Still mild jaundice 1 year post-operatively
68 M	36	Well 2 years, then dyspepsia and jaundice	Yes	No; duct 6 times normal size	Jaundice (3+); pancreatitis (2+)	1, 2	Chronic	
63 F	72	Well 6 years, then pain	Yes	No		1, 2	Chronic	
70 M	5	Biliary fistula persisted	Yes‡	No		1, 2	Subacute on chronic	
65 M	5 weeks	Jaundice. Common duct could not be explored at first operation	No	Yes	Jaundice	1, 2, 3	Chronic	Well 3 years postoperatively
64 M	9	Well 7 months, then colic	Yes	No	Hepatitis (3+); pancreatitis (3+)	1, 2	Acute gangrenous	
61 M	3	Well 2 months, then common duct obstructed	No	Yes		1, 2, 3		Well 5 years postoperatively
64 M	5	Biliary fistula, urticaria	No	Yes	External biliary fistula; jaundice	1, 2, 3	Subacute on chronic	

*All 8 patients were operated on the second time at the clinic.

†1, cholecystectomy; 2, exploratory choledochostomy; and 3, choledocholithotomy.

‡Stone impacted in the cystic duct.

were unrelated to the biliary tract.

Cholecystostomy for acute cholecystitis may prove to be a lifesaving procedure at any age and will result in relief of symptoms referable to the gallbladder for at least five years in most cases.

Cholecystostomy for acute cholecystitis offers the most to the patients over 60 years of age for whom the operative risk is appreciable even for relatively minor procedures and for whom a cholecystectomy may impose a prohibitive mortality.

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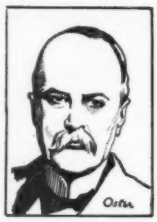

Syphilitic Stenosis of the Coronary Ostia Diagnosed During Life

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PATHOLOGICALLY, syphilis affecting the coronary ostia is not an uncommon finding. Clinically, however, the diagnosis of syphilitic stenosis of a coronary ostium is made infrequently during life. The clinical diagnosis of this condition is not only of academic interest but is of great importance because of its influence on the course and prognosis of syphilitic aortitis. The incidence of syphilitic aortitis in routine autopsies, as reported by numerous observers,[1] varies from 2.7 per cent to 7 per cent, whereas that of aortitis with syphilitic coronary stenosis varies between 8.4 per cent and 35 per cent.[2] In view of the fact that investigators report an incidence as high as 35 per cent in autopsy cases of syphilitic aortitis, it is surprising that the condition is not diagnosed more often by clinicians.

PATHOLOGY

Syphilitic disease of the coronary arteries manifests itself in two ways: (1) by obstruction of the coronary blood flow, by stenosis or occlusion of the ostia of the coronary artery, or (2) by involvement distal to the orifices, usually only of the first 30 mm., and beyond this point the vessel widens and remains patent. Involvement of the distal branches is a very uncommon finding. I will, therefore, confine this discussion to syphilis as it affects the coronary ostia. In patients with syphilitic coronary stenosis, there is no essential relationship between coronary closure and myocardial damage because of the insidious involvement of the arteries and the rich collateral circulation which is found to develop.

Inasmuch as the coronary arteries arise from the base of the aorta, syphilitic involvement of the orifices implies pre-existence of luetic aortitis. An abnormal high point of origin of the coronary arteries is an important factor in the involvement of the orifices, as the syphilitic process usually terminates at the upper level of the sinus of Valsalva, except for the penetration along the attachment of the aortic valve itself. Therefore, a high origin permits more easily involvement in the syphilitic infiltration at the root of the aorta. The atresia of the orifice may advance to the stage of actual occlusion. A high point of origin of the coronary orifices was found in 2 of our cases (Cases No. 1 and No. 3).

In the cases reported by Burch and Winsor,[1] both of the coronary ostia were involved in 29 (72.5 per cent) of the patients who had some degree of stenosis of the coronary orifices. The right coronary orifice alone was involved in 7 (17.5 per cent) and the left in 2 (5 per cent). Love and Warner[3] reported a series of 15 autopsy cases of syphilitic coronary stenosis in which 8 (5.3 per cent) revealed stenosis of both coronary ostia. In 6 cases (40 per cent) there was stenosis of the right coronary orifice only and in one (6.6 per cent), narrowing of the left coronary orifice.

The weight of the heart varied in the different reported cases, depending on the presence or absence of such additional factors as the degree of aortic insufficiency, hypertension, and aortic aneurysm. It tended to be higher in the presence of these factors, with an average weight of about 650 gm. On rare occasions, syphilitic narrowing of the coronary ostia leads to myocardial

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infarction even though dissection of the coronary artery reveals little change.

Burch and Winsor[1] report that in a recent five-year period among 6,225 consecutive routine autopsies at Charity Hospital in New Orleans, there were 4,610 (74 per cent) with a postmortem diagnosis of heart disease; in 185 (4 per cent) of these, death was due to myocardial disease of varying degrees. Infarction produced by syphilitic coronary narrowing was present in only 3 (1.6 per cent). Therefore, myocardial infarction as a result of syphilis is very rare, probably rarer than these figures indicate considering that the patient population of this institution is about half white and half Negro. This rarity of cardiac infarction from syphilitic coronary stenosis is borne out by the few cases found in the literature.

Microscopically, the stenotic portion of the coronary artery reveals marked intimal fibrous proliferation. Moritz[4] states that the process usually begins about the vasa vasorum. In some cases, there is extension of the aortic lesion into the artery and the thickened intima, and even the media may resemble granulation tissue richly infiltrated by lymphocytes. The intima is greatly thickened as a result of the formation of vascular inflammatory plaques which occlude the ostia of the coronary arteries. These exudative, edematous lesions may encircle the aortic root, forming the so-called "girdle of Venus."[5] Marked thickening of the adventitia by connective tissue proliferation is also present, as well as obliteration of the vasa vasorum and a perivascular infiltration of lymphocytes. Active syphilitic inflammation of the coronary artery may be found in any stage of syphilitic aortitis.

DIAGNOSIS

Various pathologic surveys reveal that aortic insufficiency is present in about 90 per cent of all cases of syphilitic involvement of the coronary orifices. Therefore, a consideration of the diagnosis of syphilitic coronary orifice involvement would resolve itself into a discussion of aortic insufficiency with and without this complication. A diagnosis of syphilitic stenosis or occlusion of the coronary orifices made in the absence of signs of aortic insufficiency is only conjectural and likely to be erroneous.

It should be remembered also that, contrary to the general impression, angina does occur in patients with syphilitic aortic insufficiency without the presence of narrowing of the coronary ostia, so that the clinical differentiation between cases with involvement of the coronary orifices and those without such involvement is often difficult or impossible. Longcope[6] states that the pain of aortitis is produced by inflammation at the root of the aorta. Willius[7] has stated that angina of over ten minutes' duration is likely to be due to organic coronary change and is indicative of syphilitic stenosis if the patient is a young Negro. Fortunately, in our cases, by the process of elimination, the diagnosis made during life was fairly certain to be correct.

The symptoms in cases of stenosis are due to coronary insufficiency. Inasmuch as arteriosclerosis will also produce coronary insufficiency, the symptoms are similar. The predominant symptoms are anginal pain and dyspnea. Therefore, a history of angina in a middle-aged Negro with a positive Wassermann test and no arteriosclerosis or hypertension is highly suggestive of syphilitic stenosis of the coronary openings.

The physical findings are those of syphilitic aortic insufficiency; namely, a diastolic murmur at the base of the heart, usually in the third interspace just to the left of the sternum; Corrigan's pulse; pistol-shot sounds; Duroziez' murmur; low diastolic blood pressure with high pulse pressure, and capillary pulsations. The Wassermann blood test is positive in about 95 per cent of the cases of aortic insufficiency with luetic ostial involvement. Congestive failure appears late in the course of this illness, if at all. X-ray studies offer little aid in differentiating syphilitic aortic insufficiency with or without luetic closure of the coronary ostia.

An electrocardiogram can be of great value if it reveals a myocardial infarction pattern as it did in 2 of our cases. Usually, however, it gives little evidence of syphilitic coronary involvement. Although little is known concerning the electrocardiographic changes secondary to syphilitic coronary stenosis, one would expect them to be similar to those which occur with myocardial ischemia or myocardial infarction from other causes.

In the differential diagnosis one must, of course, rule out nonluetic and other luetic causes of angina. In simple aortitis, precordial pain is usually absent, the T-waves in the electrocardiogram are not abnormal, and the aortic second sound is usually non-tympanitic. In aortic aneurysm, a fusiform or saccular dilatation of the aorta may be seen roentgenographically or fluoroscopically, and the aortic second sound is usually tympanitic. Pain, if present, is usually constant and nonradiating. Pressure phenomenon may complicate the picture. In aortic insufficiency, a large, forceful beating heart and prominent peripheral signs are observable. The pain is usually constant, but may be anginal in character. Response to treatment is poor, and the patient is usually hospitalized only once. The life expectancy is somewhat more than a year from onset of symptoms. Sudden death may ensue. The patient is usually under 40 years of age, and a positive Wassermann reaction is common. The heart is commonly only moderately enlarged.

The age, sex, and race distribution, and the Wassermann reaction, compared similarly to those found in luetic aortitis. The average age is about 45; the ratio of whites to Negroes is about 1:6. The sex ratio is about one female to four males. The Wassermann reaction is a very valuable diagnostic sign and ran as high as 100 per

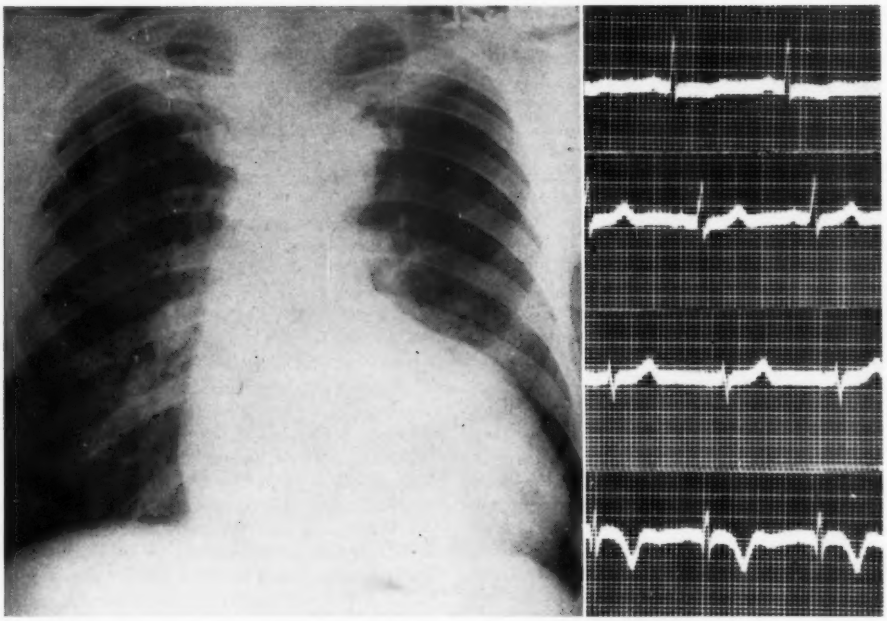

FIGURE 1 (Case 1). *Left.* Roentgenogram of chest showing moderate enlargement of left ventricle.

FIGURE 2 (Case 1). *Right.* Electrocardiogram revealing a Q-1 and flat diphasic T-1 and slightly depressed ST-1 and 2. The chest lead reveals a large Q, slightly elevated ST and coving and sharply inverted T; interpretation: anterior myocardial infarction.

cent in the Pincoffs and Love[8] series, although the average runs about 96 per cent.[2]

Antiluetic treatment is usually of no avail in this type of case, although bismuth, mercury, iodides and penicillin can be used cautiously. Arsenicals should be avoided as a Herxheimer reaction can produce death in a few hours' time.

The prognosis is poor. Patients rarely survive three to six months after the onset of pain. Death is often sudden, but a rapidly fatal course is more common. The fatal cases may occur with or without myocardial infarction.

CASE REPORTS

Case 1—N. J. L., a 40-year-old Negro male, was admitted to the Veterans Administration Hospital on July 8 with an admission diagnosis of "coronary heart disease." He gave a history of palpitation, dyspnea, insomnia, and occasionally some distress in the sternal region on exertion of four to five months' duration. These complaints were considerably worse during the last two months. An electrocardiogram taken four months previously by his private physician was reported to have revealed a coronary occlusion but he did not give any history of an acute coronary episode. There was no history of orthopnea, vertigo or syncope, rheumatic fever or thyroid disease. He had worked as a laborer until two weeks prior to admission. Although the Wassermann test was positive, he denied syphilis by name or symptom.

EXAMINATION

Physical examination revealed a colored male who was ambulatory on admission, well developed and nourished, and not appearing acutely ill. He was afebrile; his pulse was 92 and regular; blood pressure was 156/50-10. The point of maximum intensity was at the fifth intercostal space outside the midclavicular line. The area of cardiac dullness was increased moderately to the left. There was a diastolic blowing murmur at the third interspace to the left of the sternal border transmitted downward. There was also a systolic murmur at the base. A Corrigan pulse was present. No capillary pulse was detected. Pistol-shot sounds and Duroziez' sign were present. There was no edema or apparent dyspnea at rest and no cyanosis was observed. Pupils and reflexes reacted normally. Except for slight retinal arteriosclerosis, the remainder of the physical examination was not revealing. Laboratory studies of urine, complete blood count, and sedimentation rates were negative, but there was a 4 plus Wassermann and Kahn test.

An x-ray of the chest taken July 9 revealed a moderate enlargement of the left ventricle (Figure 1). The transverse diameter of the heart measured 16.5 cm., and the inside transverse diameter of the chest measured 31.0 cm. An electrocardiogram taken July 10 (Figure 2) revealed a Q-1 and flat diphasic T-1 and slightly depressed ST-1 and 2. The chest lead revealed a large Q, slightly elevated ST, and coving and sharply inverted T. These findings were compatible with an electrocardiographic diagnosis of anterior myocardial infarction.

CLINICAL IMPRESSION

The history and clinical picture were mentally reviewed at this point. An electrocardiogram taken four months ago had reportedly revealed a coronary occlusion. The electrocardiogram taken at this hospital revealed an old anterior myocardial infarction. Undoubtedly the patient had a quite definite luetic aortic insufficiency. The question arose: "Has he two conditions? A syphilitic aortic insufficiency and an occlusion of arteriosclerotic character?" It was decided that the clinical findings and the electrocardiographic findings had one etiologic basis: syphilis. It was reasoned that the syphilitic process had involved the left coronary ostia. Accordingly, the diagnoses were: "heart disease, luetic; aortic insufficiency; stenosis of the left coronary ostia; cardiac enlargement; myocardial damage and insufficiency; class IV."

CLINICAL COURSE

The clinical course appeared to be running smoothly on the usual cardiac management, and it was deemed inadvisable to begin antiluetic treatment. He complained chiefly of inability to sleep at night, but this was not caused by any particular pain, although he was subject to frequent attacks of paroxysmal nocturnal dyspnea. His condition remained stationary until about September 2, when he suddenly became decompensated, very dyspneic, and developed some edema. He grew progressively worse and expired on September 8.

AUTOPSY

At autopsy, the pathologic findings of interest were confined to the heart and the aorta. The heart in situ measured 16 cm. transversely. It was enlarged and in the anterior aspect, was about equally divided between the ventricles. Transversely, the heart measured at the base 13.0 cm.; 13.5 cm. base to apex; and 8.5 cm. in left ventricle. The auricles were distended. The endocardium of the left auricle was unaltered. The myocardium of the left ventricle was firm. The wall of the left ventricle was 17.0 mm. thick at the base and 18.0 mm. at the midportion. The endocardium of the left ventricle was unaltered and there was no marked asymmetry of the myocardium. There was no gross evidence of fibrotic infiltration of the myocardium which was firm and homogeneous throughout. The papillary bundles were enlarged. The mitral valve easily admitted two fingers; it was unaltered.

On section, the wall of the right ventricle was 2.5 mm., taken at the base and midportion. The trabeculae were prominent. The right chamber was filled with a black thrombus. The tricuspid valve was unaltered. The appendix of the right auricle contained a recently-formed thrombus. The right circumflex coronary artery was large and revealed early atheromatous changes. The conus arteriosus was large. The anterior primary descending branch of the left coronary contained practically no atheromatous change. The right coronary orifice was not occluded.

The left coronary orifice was narrowed and partially blocked by a fibrotic shelf or ridge which lay just above the opening, forming a slit-like orifice or aperture. There was an abnormally high point of origin of the coronary orifices. Practically no atheromatous change was observed in the proximal right coronary. The left coronary artery was patent and not occluded, and there was no aneurysmal change in the descending thoracic aorta. The aortic valve circumference was 8.7 cm.; the cusps were thickened, slightly rounded at the arches with no calcerous infiltrations; the commissures were moderately widened. The ascending aorta circumference was 8.9 cm.; the arch measured 8.0 cm. in circumference. The descending thoracic aorta measured 8.0 cm. in its upper portion; in its lower portion, it measured 6.7 cm. with suggestive linear striations. On section, there was increased resistance in the tissues of the wall of the aorta. The interventricular septum measured 16.0 mm. The peripheral branches of the pulmonary artery were unaltered. The pulmonic valve and the intima of the pulmonary artery were unchanged. The heart weighed 690 gm.

Microscopic study of the aorta revealed a luetic aortitis. Microscopic section of the left ventricle showed an early interstitial myocardial fibrosis with hypertrophy.

CAUSE OF DEATH

The pathologist gave as cause of death: "heart disease, luetic; aortic insufficiency; cardiac enlargement; recent myocardial insufficiency, and acute dilatation with luetic aortitis and stenosis of the left coronary ostia."

Case 2—B. A., a Negro male laborer, 41 years of age, was admitted to the Veterans Administration Hospital on August 8, with an admission diagnosis of "coronary heart disease." He gave a history of having been well until about three months prior to entrance when he first noted pain in the chest and dyspnea after meals and on exertion.

The maximum point of intensity of pain was about the xiphoid process and radiated to the left shoulder and down the left arm to the elbow. Although the pain was sudden in onset, it was dull in character and did not particularly alarm the patient. It lasted ten to twenty minutes and occurred with increasing frequency until at admission he was experiencing two or three such attacks daily. It was this increasing frequency which brought the patient to the hospital. He did not recall any outstanding episodes of very severe chest pain. There was no history of orthopnea, vertigo or syncope, edema, cyanosis, genitourinary complaints, rheumatic fever or thyroid disease. The patient denied syphilis.

EXAMINATION

The patient was ambulatory on admission, but was put to bed immediately. Physical examination revealed a temperature of 99° F.; his pulse rate was 96 and regular; respiratory rate was 24, blood pressure 120/80. He was 70 inches in height and weighed 156 pounds, and did not appear acutely ill. Pupils were circular, equal, and reacted

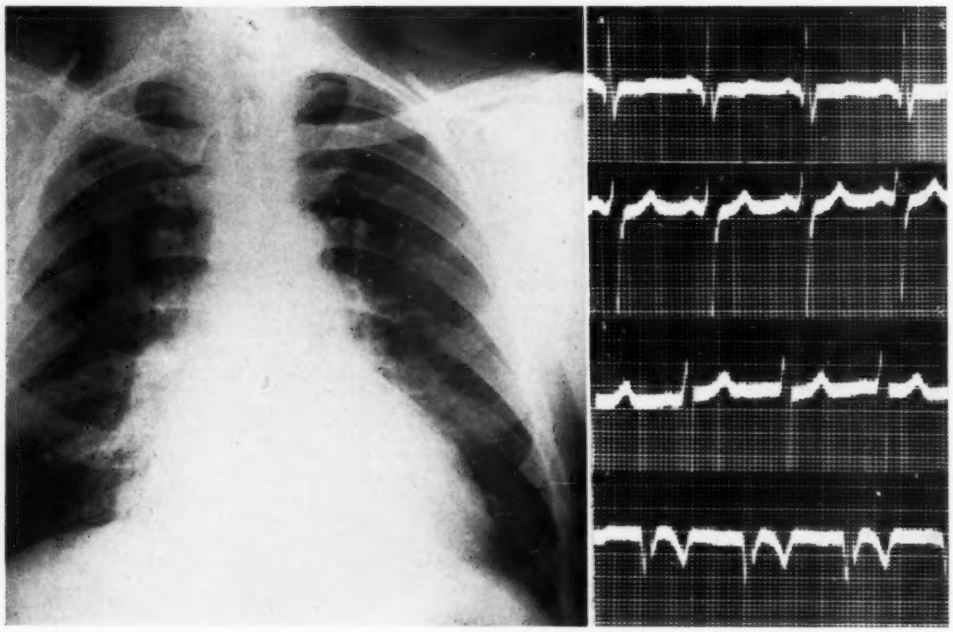

FIGURE 3 (Case 2). *Left.* Roentgenogram of chest. Total width of the heart, 19.7 cm.; total inside transverse diameter of the chest, 32.0 cm. The heart is thus considerably enlarged and the enlargement is left-sided. The appearance suggests an aortic insufficiency. The lung fields appear clear.

FIGURE 4 (Case 2). *Right.* An electrocardiogram revealing evidence of an anterior infarction on the basis of a Q and deeply inverted T wave in CF-4.

well to light and accommodation. The lungs were essentially normal.

The point of maximum intensity in the apex beat was in the fifth intercostal space just outside the midclavicular line. The area of cardiac dullness was increased moderately to the left. A soft systolic murmur was heard at the mitral area and also at the base. There was a barely audible diastolic murmur at the third interspace to the left of the sternum, heard only in a sitting position during deep expiration. No Corrigan or capillary pulses were detected. Pistol-shot sounds were absent and Duroziez' sign was negative. There was no edema or dyspnea present. Cyanosis was absent, but there was mild retinal arteriosclerosis. No peripheral arteriosclerosis was detected. His abdomen revealed no tenderness, masses, or palpable viscera. No scar was visible on the penis.

CLINICAL IMPRESSION

The clinical impression at this time was that of "cardiac disease, coronary sclerosis; cardiac enlargement; anginal syndrome; class IV." The evaluation of the questionable diastolic murmur at the base was held in abeyance until results of serologic tests were received. Other than a 4 plus Wassermann and Kahn test, laboratory studies of urine, complete blood counts, and sedimentation rates were not revealing.

An x-ray of the chest taken on August 9 (Figure 3) revealed a left-sided enlargement of the heart and a cardiac configuration which suggested aortic insufficiency.

An electrocardiogram taken August 10 (Figure 4) revealed evidence of an anterior myocardial infarction on the basis of a Q and a deeply inverted T wave in CF-4.

The presence of the faint diastolic murmur at the base took on renewed significance in view of the positive serology and after further examination and fluoroscopic study, the original impression was changed to "heart disease, luetic, with aortic insufficiency."

Although the electrocardiogram was highly suggestive of an anterior myocardial infarction, there was no definite history of an acute coronary episode. This case was so similar to Case 1 that it was concluded that here too, the syphilitic aortitis had involved the left coronary ostium. Accordingly, the diagnoses were changed to "heart disease, luetic; aortic insufficiency; stenosis of the left coronary ostium; cardiac enlargement; myocardial damage; anginal syndrome; class IV."

COURSE

The patient was doing well on the usual cardiac management and it was deemed inadvisable to begin antiluetic

treatment. On the night of September 4, he experienced a sudden attack of the most severe pain he had ever had. He was sitting up in bed gasping for breath when seen by the physician on duty. Moist râles were noted throughout both lungs, posteriorly, and there was slight edema of the ankles.

The patient was treated with aminophylline, digitalis, and oxygen. He became increasingly dyspneic and edematous and coughed up some bloody, frothy material. He expired suddenly on September 5.

AUTOPSY

At autopsy, the pathologic findings of interest were confined to the heart and the aorta. The heart weighed 365 gm., and in situ measured 15 cm. transversely. The organ measured 13 cm. transversely at the base and 13.6 cm. base to apex. The auricles were distended, but the endocardium of the left ventricle appeared normal. The myocardium of the left ventricle revealed definite evidence of infarction of the major portion of the left ventricle and lower portion of the interventricular septum. The mitral and tricuspid valves were unaltered. On section, the wall of the right ventricle measured 2.7 mm. taken at the base and midportion. The trabeculae were prominent.

The right circumflex coronary showed early atheromatous changes. The anterior primary descending branch of the left coronary artery revealed only mild atheromatous changes. The right coronary orifice was only slightly narrowed. The left coronary orifice was markedly narrowed at the aortic wall, but beyond this point the vessel was patent and moderately widened. There was no abnormally high point of origin of the orifices. The aorta showed oak-bark wrinkling at the root. There were no definite aneurysmal changes of the aorta. The aortic valve in circumference measured 9.5 cm. The cusps were slightly thickened and the commissures were only slightly widened. There were circumscribed, elevated, edematous plaques in the first part of the aorta and in the sinuses of Valsalva. The ascending aorta in circumference measured 9 cm.; the arch measured 8.2 cm. in circumference. The descending thoracic aorta measured in its upper portion 8.1 cm.; in its lower portion 6.9 cm. On section, there was increased resistance in the tissues of the wall of the aorta. The interventricular septum measured 15 mm. The pulmonic valve and the pulmonary artery and its branches were unaltered.

Microscopically, the aorta was the seat of intimal thickening and infiltration with leukocytic cells. The vasa vasorum showed intimal thickening and perivascular collars. There was considerable lymphatic infiltration in the tissue between the adventitia and the media. The microscopic diagnosis was syphilitic aortitis.

Microscopic section of the left ventricle revealed cardiac muscle to be edematous, and many of the fibers showed hyalinization and necrosis. The endocardium was thickened by fibrin, round cells, and some polymorphonuclear cells.

CAUSE OF DEATH

The pathologist gave as cause of death: "heart disease, syphilitic; aortic insufficiency; cardiac enlargement; myocardial infarction, anterior; and stenosis of the coronary ostia, severe on left, and mild on right."

Case 3—R. R., a Filipino male, 35 years of age, had become suddenly ill with severe pain in his chest radiating to both arms, while unloading supplies in an Army hospital in the Philippine Islands in 1945. He was immediately brought to the native ward of this Army hospital where a history was obtained of his having had similar attacks for the past three months. It was difficult to obtain a reliable history because of language differences. He denied syphilis by name or symptom.

EXAMINATION

Physical examination on admission revealed a temperature of 99.2° F.; pulse rate 120; respiratory rate 30, and blood pressure 140/60. He sat on a cot gasping for breath. His pupils were negative. The heart was moderately enlarged to the left. There was a definite diastolic murmur at the third interspace to the left of the sternal border, transmitted downward. There was also a systolic murmur at the base. There were no peripheral signs of aortic insufficiency. Moist râles were heard throughout both lungs, posteriorly. The liver was palpable 4.0 cm. below the costal margin. Slight edema of the ankles was present.

Due to the conditions of operating in the field, no blood tests were made, nor was an electrocardiogram accomplished prior to death.

CLINICAL IMPRESSION

It was the clinical impression that the diagnoses were: "syphilitic heart disease; aortic insufficiency; cardiac enlargement, and anginal syndrome, class V." Although the history was compatible with a coronary occlusion on an arteriosclerotic basis, in view of the clinical impression of syphilitic aortic insufficiency and aortitis, the youth of the patient, and his race, it was reasoned that the syphilitic process had involved one or both of the coronary ostia. Accordingly, the diagnosis of syphilitic stenosis of the coronary ostia was also made.

COURSE

The patient was treated with aminophylline, oxygen and sedation and, in view of the obvious decompensation, also with digitalis. He became increasingly dyspneic and edematous and coughed up bloody, frothy material. He expired suddenly after five hours of hospitalization.

AUTOPSY

An autopsy was performed three hours after death. The principal findings were: syphilitic aortitis with marked narrowing of the mouths of both coronary arteries. The ostia of both coronary arteries had an abnormally high point of origin. The orifice of the left coronary artery was narrowed almost to a pinpoint. The right orifice was narrowed to a diameter of 1 mm. There was moderate cardiac hypertrophy. There was only mild myocardial fibrosis. The aortic valves were moderately thickened and the commissures were moderately widened. The other valves did not show evidence of inflammation. There was moderate concentric thickening of the branches of the coronary arteries throughout their course. On section, however, the thickened arteries were grayish and the yellow color of atheromatous degeneration. The eccentric thickening of the wall and the

calcification, usually found in arteriosclerosis, were absent.

Tissue for microscopic examination was taken at the autopsy, but because of the pressure of events in the field, it went astray. However, grossly there was no doubt that this was a case of syphilitic aortitis and aortic insufficiency with stenosis of the coronary ostia, as well as syphilitic coronary arteritis. It is unfortunate that the latter diagnosis was not substantiated microscopically. The stenosis of the orifices and the coronary arteritis, in combination, impaired the blood supply of the myocardium and were undoubtedly responsible for the sudden death.

In our cases, the short course of the illness, the typical pain of coronary occlusion, the lack of response to treatment, and the fact that their course was rapidly downhill, fitted in well with the diagnosis of syphilitic stenosis of the coronary ostia.

SUMMARY AND CONCLUSION

THREE cases are reported of syphilitic stenosis of the coronary orifices which were diagnosed during life. The making of a diagnosis of this kind throws considerable prognostic light on a case of coronary insufficiency inasmuch as it signals a short course and probable sudden death.

In view of the fact that investigators have reported the presence of coronary orifice stenosis in cases of syphilitic aortitis to be as high as 35 per cent at autopsy, it is surprising that the condition is not diagnosed more often during life.

Although its recognition is largely inferential, the following points may aid in making a clinical diagnosis: (1) The keeping in mind of its rather frequent association with aortic insufficiency; (2) the fact that cardiac symptoms appear at an earlier age in cases of aortic insufficiency when the coronary orifices are affected; (3) the observation that cardiac pain and dyspnea are its most common attendants, and when these occur in a patient under 40 years of age, especially in a Negro who is suffering both from syphilitic aortitis and aortic insufficiency, ostial involvement should be suspected, and (4) the occurrence of paroxysms of nocturnal dyspnea or attacks of pulmonary edema, provided coronary arteriosclerosis is not present, suggests stenosis or occlusion of one or both coronary orifices.

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EXPERIMENTS ADVANCE INTERPRETATION OF ELECTROCARDIOGRAMS

THE theory of zonal interference for interpretation of electrocardiograms has been advanced from animal experiments to human studies by Dr. Louis H. Nahum and Dr. Hyman M. Chernoff of Yale University. Developing their work from original studies on dogs, the researchers have now determined, on a basis of human studies, what each portion of the heart contributes to the general electrocardiographic picture, have demonstrated that the lower portion of the heart recovers more rapidly during a heart beat than the upper part and is warmer in temperature, and have provided a clear explanation of what happens to the various segments of the heart when the body receives insufficient oxygen.

The zonal interference theory is based on the concept that the interaction of opposite electrical forces from different zones of the heart creates each electrocardiogram. The researchers found that certain changes occurring in the electrocardiogram after coronary thrombosis or certain other diseases are due to a slowing up of the recovery process in the affected portion of the heart. With the aid of the new theory and accompanying charts and diagrams, the exact location of such phenomena as blood clots may be fixed.

Diagnostic Clinic

Cancer of the Larynx

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This is called a diagnostic clinic, but, of course, we will also refer to treatment. The subjects of diagnosis and treatment are so closely related that it is necessary to overlap somewhat in discussing either of them.

In connection with cancer in all parts of the body, early diagnosis, of course, is fundamentally important, and in presenting this series of 7 patients treated by different methods—3 by laryngofissure, 2 by laryngectomy, and 2 by irradiation—we will refer briefly to the history and diagnosis and then discuss the selection of treatment.

Before presenting the patients I should like to call your attention to some statistics which were presented at the last annual meeting of the American Medical Association, and which were based on a series of 612 cases treated between 1930 and 1947.

The distribution between the three methods of treatment which we use most, laryngofissure, laryngectomy, and irradiation, was as follows: 209 laryngofissures, 244 laryngectomies, and 159 patients treated by irradiation. Of course, the five-year statistics could not be based on the whole series because it is necessary for the five years to elapse before such statistics can be established. Study of the determinate cases in which we could give five-year results showed that laryngofissures gave 81 per cent cures, laryngectomies 66, and irradiation 51, or an over-all percentage figure of 68 for the patients treated by these three methods.

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Presented November 10, 1948, before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio.

These methods of treatment are not competitive. We do not conclude that laryngofissure will cure more patients than laryngectomy, or that irradiation will cure less than any other method, because in each case the method of treatment was selected for certain reasons, according to the criteria that we have established for the selection of treatment methods.

CASE REPORTS

Now I should like to present the patients who have been kind enough to come here this morning. They are all from Ohio, some from Cleveland, others from cities in the vicinity.

Case 1—First we have Mr. W. D. C. of Mansfield, Ohio, a patternmaker by occupation, who consulted us in February of 1944 at the age of 45 years. He had complained of hoarseness since October of 1943. He felt that the onset of hoarseness was rather sudden and in fact dated it from an episode of choking on nut candy.

Indirect laryngoscopic examination showed an ulcerative lesion occupying the middle third of the right cord; the left cord appeared normal, and both cords moved normally.

A tentative diagnosis of carcinoma of the right cord was made, and this diagnosis was confirmed by direct laryngoscopic biopsy, the lesion being called a squamous cell carcinoma Grade II by the pathologist.

Laryngofissure was done on February 28, 1944. Convalescence was uneventful. The patient was discharged in about ten days. He has developed an excellent voice, and mirror examination on his last

check in Philadelphia showed the left cord remaining normal, the right replaced by a cicatricial band with which the left cord approximates perfectly, though motility of the operated side remains slightly impaired.

Summarizing, this patient had an early carcinoma of the middle third of one vocal cord which was treated by laryngofissure, and he will have completed his fifth postoperative year in February, 1949.

Will you stand up and say a word, please?

PATIENT: Good morning, folks.

DR. JACKSON: Thank you very much. I don't think we have to ask him to speak any further with that sample of his voice.

Case 2—Mr. J. M. of Dayton, Ohio, general manager of his company, first consulted us December 11, 1944, in his fifty-fifth year. He had complained of hoarseness since November, 1943, a little over one year.

Mirror examination showed some roughening all along the margin of the left cord, most marked in its middle third. The extreme anterior tip of the opposite cord also showed slight roughening. A diagnosis of carcinoma of the larynx had already been made and was proved by biopsy by the referring physician.

Laryngofissure was done on December 14, 1944. The entire left cord and ventricle, a portion of the left ventricular band, and the anterior half of the right cord were excised. Convalescence was a bit prolonged because of some cartilage infection and necrosis. Some granulomatous tissue was removed from the interior of the larynx in December. He has recovered and has enjoyed excellent health, but his voice has never been quite as strong as he would like it, and in a letter dated January, 1948, he stated, "There is one serious gripe I do have which is the result of my operation, and it also involves Mrs. M. It so happens she can shout louder and make the most noise, hence I haven't a chance in our arguments and naturally always lose, and this becomes very disconcerting after a time."

Mr. M. had a slightly more extensive lesion than the previous patient, but it was thought suitable for extirpation by laryngofissure, and he is now a little over four years past operation with no sign of recurrence.

Let us hear that voice that you don't find satisfactory.

PATIENT: What do you want me to say?

DR. JACKSON: It sounds nice and soothing to me.

PATIENT: I don't know just exactly how it sounds to me.

DR. JACKSON: Mr. M. is a little hard of hearing so cannot appreciate how his voice does sound, but at times he doesn't find it quite adequate. Do you talk on the telephone?

PATIENT: Oh, yes, I talk very well over the telephone.

Case 3—Mr. J. L. of Cleveland, a tailor by occupation, was 49 years of age at the time he consulted us in January, 1941. He gave a history of hoarseness for four or five months' duration. The diagnosis of carcinoma had already been proved by biopsy elsewhere.

TOTAL laryngectomy was advised as the safest procedure; x-ray therapy was also considered but it finally was decided to attempt extirpation by laryngofissure, and this operation was done on May 21, 1941. The decision to do laryngofissure was a fortunate one, because this man is now free of any sign of recurrence for over seven years.

Will you say a few words?

PATIENT: How do you do, folks?

DR. JACKSON: How long has it been since you had your operation?

PATIENT: Seven years. I am doing pretty well.

DR. JACKSON: Are you feeling well generally?

PATIENT: Yes, sir.

DR. JACKSON: This patient lives out of town now and was kind enough to get over here early enough to be with us for the clinic. We very much appreciate his coming.

Case 4—Mr. A. L., age 50, of Cleveland consulted us first on August 6, 1945, complaining of hoarseness of two years' duration, most marked in the second year. He had a lesion of the right vocal cord which was quite extensive, involving the entire cord and extending down into the anterior subglottic region, as well as passing over to the anterior end of the left cord. Motility on both sides was very good.

The diagnosis had already been proved by biopsy in Cleveland, but the patient came to us hoping that we might see our way clear to do a less radical operation than that which had been advised. However, because of the subglottic extension of the lesion and its histologic character (Grade III) we felt that unquestionably a total laryngectomy would give the best prospect of cure. The patient decided to remain in Philadelphia for operation, and total

laryngectomy was done on August 14, 1945. He had an uneventful convalescence and was discharged in two weeks.

He has developed an exceptionally good voice and has shown no signs of recurrence or metastasis more than three years after operation.

I want you to hear his voice.

PATIENT: Good morning, folks.

DR. JACKSON: I think he is probably the prize patient for volume.

PATIENT: Well, I just feel fine, and I seem to be getting along pretty well.

DR. JACKSON: Thank you very much.

Case 5—Mr. G. E. of Springfield, Ohio, age 51, a clerk in a grocery store, consulted us November 20, 1946, giving a history of hoarseness for about one year previously. He had a lesion involving the entire right cord and causing marked impairment in motion. The left side of the larynx appeared grossly normal.

The diagnosis had already been confirmed in this case as epidermoid carcinoma, moderately differentiated (squamous cell Grade II).

Total laryngectomy was the only method of treatment offering a prospect of cure, and this operation was done on November 26, 1946. The patient has had no sign of recurrence or metastasis and enjoys very good health.

Summarizing, this patient had a lesion typical of the sort for which we consider total laryngectomy the most suitable treatment, but which would not have been suitable for either laryngofissure or irradiation because of the extent of the lesion and particularly the fixation of the cord.

Will you speak to us?

PATIENT: Good morning. I have been talking one year the 10th of this month.

DR. JACKSON: Do you think your voice is still improving?

PATIENT: Yes, I do.

DR. JACKSON: I think your wife has helped you quite a lot in instruction, hasn't she?

PATIENT: That is true, yes, sir.

Case 6—Mr. W. G., 49 years of age, of Lorain, Ohio, an attorney, was sent to us in February, 1946, with a history of intermittent hoarseness dating since the previous summer. He complained also of productive cough and shortness of breath.

Mr. G. had had a biopsy several months previously which was reported negative. He had then gone to Florida for his health. There he had increasing trouble with his larynx, which showed redness, congestion, and inflammatory reaction with edema. He was treated with penicillin and yet became more and more short of breath, and he finally had to have an emergency tracheotomy done. He almost died at the time of the tracheotomy; he stopped breathing for three or four minutes and was brought back with artificial respiration. Two days after the tracheotomy an abscess ruptured about two inches above the tracheotomy tube, and pus drained for two days. Comparative biopsy studies were done and were negative. The patient was referred to the Temple University Clinic by his Florida physician.

On his arrival in our clinic, mirror laryngoscopy showed a moderate degree of edema symmetrically distributed to the supraglottic structures, and a nodular ulcerated lesion extending downward from the base of the epiglottis. Some thin purulent secretion was present in the larynx.

We made a diagnosis of carcinoma of the larynx with invasion of thyroid cartilage and secondary perichondritis. This diagnosis was confirmed by direct laryngoscopic biopsy and the lesion was considered a squamous cell carcinoma Grade II. Positive biopsy was also obtained from granulations present in the fistulous wound above the tracheotomy.

The prognosis was thought very grave indeed, and the patient was sent home to Ohio for palliative x-ray treatment. A course of 12 daily treatments of 2,000 r each was given him. This treatment was concluded April 28. Three months later the patient was to have been given some more intensive treatment, but his weakened condition at that time led to postponement. However, his condition began to improve and it was found possible to remove the tracheotomy tube August 12. When we next saw him on September 6, 1946, we found no evidence of persisting disease inside the larynx or in the skin anteriorly, but a metastatic mass had developed at the angle of the right mandible.

Dr. John Blady at the Temple University Hospital did a radical neck dissection and implanted radon seeds; the patient was discharged on the eleventh postoperative day.

During the past two years Mr. G. has enjoyed good health and there has been no further development of recurrence or metastasis.

Summarizing, this man was thought to have an inoperable cancer of the larynx and was referred

back to his physician with a suggestion that palliative irradiation be given. The primary lesion showed better response than was expected to this treatment, but a metastasis developed. This we treated radically by neck dissection and interstitial irradiation with radon seeds. As in a number of other cases, this treatment of the cervical metastasis proved successful. The success of the palliative irradiation in curing the primary lesion can perhaps best be explained by the location of the cancer in the anterior portion of the larynx where maximum efficacy could be obtained.

Will you speak for us?

PATIENT: Good morning.

DR. JACKSON: Are you using your voice right along?

PATIENT: Right along, yes, Doctor.

DR. JACKSON: You see that the neck is clean, there is no sign at all of any masses, but you can see that there is quite a lot of structure missing that was taken out at the time of the block dissection.

Case 7—Our last patient, Mr. J. G. R., age 50, of Conneaut, Ohio, a coal chute operator, came to us complaining of hoarseness of two years' duration and some soreness in the throat. He stated that a papilloma had been removed in Cleveland several months before by direct laryngoscopy, but he was now sent to us by his physician in Conneaut.

Mirror laryngoscopy showed irregular thickening of both cords, the left throughout its length and the right chiefly in its anterior third. Motility seemed to be normal. Biopsy showed the lesion to be a squamous cell carcinoma Grade II.

We felt that this was one of the cases in which the lesion was a little too extensive for laryngofissure, and yet one in which because of the good preservation of motility and the anterior location of the lesion, a fair chance of cure was offered by irradiation. A course of protracted fractional irradiation was instituted on January 6, 1948, by Dr. John Blady at the Temple University Hospital. The patient was given a total of 5,168 r in daily treatments of 125 r each day, the treatments being completed February 11, 1948. When he was seen on May 17 for a checkup he reported that he had been eating well and that he had gained 15 pounds and his voice was quite good.

Mirror examination showed some congestion of the mucous membrane, and the right cord seemed slightly thickened, but presented a smooth surface. The appearance did not suggest residual carcinoma. At Dr. Blady's examination of August 17, 1948, the cords appeared normal in form and movement. No nodes were palpated on either side of the neck.

In summary, this patient had a rather extensive Grade II carcinoma of the larynx with preservation of good motility. It was decided to give him a chance of cure by irradiation rather than doing a total laryngectomy, which would be the only surgical procedure justifiable in his case.

FINALLY, I want to say that diagnosis is still vitally important in relation to cure rate in patients with cancer of the larynx, regardless of what treatment method is used, and we still have to keep on preaching the diagnosis of hoarseness. For years we have been insisting that if a patient is hoarse longer than a few weeks he should have a most intensive study of his larynx with perfect visualization of all parts of it, and, if necessary, biopsy not once but two or three times if it remains suspicious clinically. The early establishment of diagnosis is going to make the early selection of the best treatment method possible and is going to push the cure rate in cancer of the larynx from 75 or 80 per cent up to 90 per cent in favorable cases.

Diagnostic Clinic

Radioactive Iodine for Treatment of Thyroid Disease

GEORGE CRILE, JR.

CLEVELAND CLINIC, CLEVELAND, OHIO

I WOULD like to present a practical demonstration of the use of radioactive iodine on a patient with Graves' disease, employing a Geiger counter and a therapeutic dose of radioactive iodine. Dr. Glasser of the Physics Department of the Cleveland Clinic, Dr. Wise of the Department of Roentgenology, and I would like to demonstrate the actual technic of administering the radioactive iodine.

This patient has hyperthyroidism of relatively recent onset. It is quite severe; his basal metabolic rate is +72. He has a diffuse enlargement of the thyroid and every clinical sign of hyperthyroidism. As the patient steps over to Dr. Glasser, little clicks on the Geiger counter may be heard; these clicks represent stray irradiation from the cosmic rays and from the radioactive iodine which is present in the room. But there is no significant increase as you measure him.

The Geiger counter immediately begins to pick up as the radioactive iodine approaches. We will give a tracer dose of radioactive iodine to the patient and follow it through his system with the counter.

Among the properties of radioactive iodine which make it an ideal therapeutic agent in diseases of the thyroid is, first, the fact that its activity is largely in the form of beta irradiation. Almost all of it is in that form, meaning that the rays penetrate only to a distance of 1 or 2 mm. through the tissues. One millimeter is about the thickness of your fingernail, and so the tissues outside of the thyroid, that is, the recurrent laryngeal nerve, parathyroid glands, trachea, etc., do not obtain any significant amount of this beta irradiation.

Presented November 12, 1948, before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio.

The second property of radioactive iodine which makes it ideally adapted in treatment of diseases of the thyroid is that its half-life is only eight days. In other words, if a glass of radioactive iodine were allowed to stand, eight days from now it would have only half the radioactivity that it has now, and at the end of a month it would have very little radioactivity and the radioactivity would, to all intents and purposes, be gone in a matter of a few months. It is not retained in the system like radium or some of the long-lasting isotopes; it is destroyed of its own accord.

The third factor is that radioactive iodine behaves chemically exactly like ordinary iodine, that is, it is picked up by the thyroid in hyperthyroidism and is concentrated and stored there. This concentration is amazing; it is 10,000 times that of any other tissue in the body and consequently the thyroid gland receives proportionally as much irradiation because the iodine is so concentrated in this one small area.

Let us see what has happened to the radioactive iodine which the patient has taken. At first, of course, it goes into the stomach and the intestinal tract; the patient is now very radioactive. Most of the iodine is over the stomach, but some of it is also seen down in the legs because it is circulating through the blood stream on its way to the thyroid. Already it is beginning to be concentrated in the thyroid gland; there is already much greater radioactivity in the thyroid gland than in the legs, in which there is about a comparable amount of tissue and a comparable amount of blood. Even in

GEORGE CRILE, JR.

this short period of time the material has been absorbed from the stomach, has circulated through the blood stream, and is beginning to be concentrated in the thyroid gland. A very small amount is excreted through the urinary tract.

I would like to show you another patient who was treated yesterday with a therapeutic dose of radioactive iodine. This patient was given a large dose, and it is concentrated in the thyroid gland. She is so radioactive that the Geiger counter cannot well demonstrate the concentration in the thyroid because it goes in every direction and it is not possible to get an accurate evaluation. If you screen off the thyroid with lead, you find that almost all the irradiation which is indicated on the counter is now concentrated in the thyroid except for a small amount which is still being excreted through the urinary tract.

Most of the iodine, however, which is excreted through the urinary tract is excreted only after it has been stored in the thyroid for a sufficient length of time to lose its radioactivity. Thus it is in the inert form and does no damage to the renal epithelium. We have repeatedly treated patients with severe renal damage; one in particular had a hydronephrosis on one side and a nephrectomy on the other. The blood urea was over 90 before therapy was begun, and her renal function improved after treatment. This improvement was not due to the direct effect of the radioactive iodine, but to the indirect effect of controlling the hypermetabolism which put less strain on the damaged kidneys.

THERE is a very marked difference between the hyperthyroidism in the first patient and that in the second. The first patient has Graves' disease, exophthalmic goiter, if you like. We call it Graves' disease because we think it is a systemic disease imposed upon the thyroid from without. The thyroid gland undergoes diffuse hypertrophy and hyperplasia and the entire gland hyperfunctions. The takeup of radioactive iodine in these cases is diffuse throughout the entire gland.

In the case of the second patient, however, the patient has a multinodular goiter which has been present for many years. This type of goiter takes up radioactive iodine in a very irregular way.

Naturally, there is a marked difference in the reaction of these two types of patients. The first group will react homogeneously, and if anything happens to the thyroid, the goiter will disappear, whereas in the patients with nodular goiters with hyperthyroidism the areas which do not take up radiation will persist and their function will persist, so it takes repeated doses and four or five times larger doses than in Graves' disease, to accomplish the same result. You have to "burn it off layer by layer," first "burning off" the most active areas and going on to take the less active areas when they resume activity.

To show the ease with which the hyperthyroidism of Graves' disease is controlled, I would like to present another patient. This woman is a registered nurse and was perfectly well, working every day, until a few months ago when she suddenly developed extreme weakness and nervousness, palpitation, and tachycardia. She had classic symptoms of Graves' disease. The thyroid was enlarged to an estimated weight of about 75 gm., about three times its normal size, and she had a basal metabolic rate of +40 per cent. Six weeks ago she was given 4 millicuries of radioactive iodine. Today her basal metabolic rate is −8 per cent and clinically she has no residual symptoms of hyperthyroidism. The thyroid is no longer either visible or palpable except as a normal thyroid.

DR. CRILE: How soon after treatment did you begin to notice improvement?

PATIENT: My pulse was slower in four days, but Dr. Crile thought I imagined that. I am quite positive I felt better in four days.

DR. CRILE: Some patients respond very promptly to this treatment. There is no untoward reaction. The dosage is very small compared with the amount of irradiation that is given by roentgen therapy diffusely over large areas of the body. It is very intense in the area which is irradiated, but not enough to cause irradiation sickness. Only a very few of the patients complain of any tenderness of the thyroid. You noticed nothing locally in the neck or any place else, did you?

PATIENT: No.

DR. CRILE: Usually within a week or up to three or four weeks they begin to notice this improvement. It is progressive and gets better and better for about three months.

This has been an unusually rapid and complete response. Six weeks is a little less than is usually required to get a complete response. It is entirely possible that this patient may go on to develop hypothyroidism because the response has been so dramatic. Many of these cases of hypothyroidism which occur after treatment with radioactive iodine are only transitory and full recovery takes place just as it may in the hypothyroidism that follows thyroidectomy.

Interestingly enough, the incidence of hypothyroidism following treatment with radioactive iodine is almost identical to that following thyroidectomy. We have treated about 105 patients so far with radioactive iodine for hyperthyroidism. About 35 of these cases have been followed long enough to know whether they are going to develop hypothyroidism, and this has occurred in about 10 per cent.

There are two ways in which you can give the treatment. One way is to calculate the size of the gland and the amount of iodine that it takes up and then give exactly the amount you think is going to effect a cure. Unfortunately, no surgeon knows exactly the amount of thyroid it is necessary to remove to effect a cure in a given case of Graves' disease. In one case he may remove a great deal and perhaps a recurrent hyperthyroidism may occur; in the next case he may leave a good deal and the patient may develop a postoperative hypothyroidism. It is an empiric treatment and I believe much of it depends upon the actual cycle of the disease rather than the amount of tissue removal or destruction accomplished by the procedure.

If you put the disease into remission it may overreact; if you take out just the right amount so that at the end of two or three months the metabolism is normal, it may, in spite of that, over-react and the patient will go into hypothyroidism. Our experience has shown that the development of hypothyroidism following thyroidectomy does not necessarily mean that too much of the thyroid was removed. These patients still may have adequate amounts of thyroid tissue palpable, and occasionally Graves' disease will spontaneously go over from an active hyperthyroid state into clinical hypothyroidism. Hypothyroidism, therefore, depends more on the activity of the thyroid remnants than on their size.

As an indication of the way we like to treat these patients I have brought another patient today who came to us about five months ago with a basal metabolic rate of +70 per cent and severe hyperthyroidism recurrent after thyroidectomy. It was a typical case of Graves' disease. She was given 4 millicuries of radioactive iodine and two months later the basal metabolic rate had fallen to +27 per cent. You felt entirely well two months later, did you not?

PATIENT: Yes.

DR. CRILE: She had no symptoms of hyperthyroidism; she was completely controlled clinically, but the basal metabolism had lagged a little behind. We did not treat her again at that time because our experience had shown us that when there is a marked tendency toward remission and the metabolism has fallen from a high to a medium level very rapidly, it will continue to go even lower after the radiation is out of the thyroid and the actual effect of the iodine is over. That is the momentum which you have given the disease in the direction of cure. Without any further treatment her metabolism has come down to normal limits and is now averaging about +13 per cent. She has gained about 20 pounds and is feeling entirely well.

As an example of the other method of treatment with radioactive iodine, we have another patient who was treated relatively early in our experience with the material. She had a twice recurrent goiter. You had had two thyroidectomies, had you not?

PATIENT: Yes.

DR. CRILE: She had temporary relief after each operation, followed by recurrence of the hyperthyroidism and was very loath to submit to further surgical measures. We decided to attempt to cure her in a single treatment, which we did very effectively; her basal metabolic rate fell from +29 per cent to −4 at the end of two months. No further treatment was given, but four months after the original administration of iodine, the basal metabolic rate had fallen to −30 per cent and clinically she had hypothyroidism. At that time you did not feel very well, did you?

PATIENT: No.

DR. CRILE: Since then she has been on desiccated thyroid, 1 to 2 gr. daily. Already her requirements of thyroid seem to be less than before; her metabolism is −2 per cent on 1 gr. of thyroid daily, and I believe she is making a spontaneous recovery from the temporary hypothyroidism.

She had 75 gm. of thyroid tissue—a visible goiter—which has completely disappeared. That is the case in all of these patients with Graves' disease—the goiter has disappeared.

This next patient is a lady well along in the seventies; she came to us with a history of recurrence of a goiter which was removed twenty-five years ago. Because she had other complicating diseases and because of her age, we felt it unwise to remove the large multinodular goiter which almost filled her neck. After giving her 25 millicuries of radioactive iodine, six times the dose given to the other patients, this goiter has disappeared. Her hyperthyroidism which originally was moderately severe with a basal metabolic rate of +30 has now disappeared. She feels entirely well from the standpoint of her hyperthyroidism and has gained 20 pounds in the past four months. She had two treatments, 15 and 10 millicuries respectively.

The next case is very similar to the one just presented. This lady had a large multinodular goiter which I estimate was twice the size of the goiter which you see in the neck today. Although this thyroid is still visible, it is much smaller than it was and the patient's hyperthyroidism is almost completely controlled, her basal metabolic rate having fallen to −9. She has had her last treatment.

There is no question in my mind but that any type of hyperthyroidism associated either with nodular or diffuse goiter can be treated with this substance. However, in nodular goiters with hyperthyroidism, the goiter does not entirely disappear, and larger doses and longer periods of time are required to effect a cure. Except in the older age group, therefore, we believe that a safer and more definitive treatment of nodular goiter is achieved by the use of thyroidectomy after proper preparation with propylthiouracil.

In the older age groups, treatment with radioactive iodine is a lifesaving procedure. This last patient came into the clinic by ambulance, could not walk because of the extreme prostration and weakness associated with her severe hyperthyroidism, and she would not have tolerated any type of surgical procedure. It would have taken months to prepare her for operation.

THERE is one other condition in which radioactive iodine is of value; that is carcinoma of the thyroid. This patient was 26 years of age when he developed a papillary carcinoma of the thyroid which could not be removed locally because of fixation and extension. There was one cervical nodule about the size of a walnut which was not removed at the time of operation. This tumor had metastasized to the lung. His lungs looked like a snow storm, like silicosis, and at first we interpreted it as that, but his condition grew progressively worse. He had a small dose of radioactive iodine yesterday, and the tumor in his lungs is concentrating this substance more today than it does in the thyroid area; by taking up the iodine, the tumor is destroying itself. There is a high concentration over the lower lung field and less in the neck region.

You cannot rely on treating carcinoma of the thyroid by this means, however, because only a few patients, about 1 in 25 or 30, will pick it up in adequate amounts. This patient did, and the tumor has decreased in size from about the size of a walnut to one that you can scarcely palpate at the present time. There is a little, firm, indurated area still present. I believe he is going to completely destroy this thyroid tumor which is, of course, of very low malignancy to begin with. He might have lived for many years without any treatment with this type of tumor, but this will probably be an effective means of controlling it.

Let us return to the first patient presented and see how much concentration there is in the thyroid at the present time. There is still a great deal in the stomach but actually more seems to be in the thyroid now than in the stomach, and it is only

about twenty minutes since he was given the radioactive iodine.

PRECAUTIONS IN HANDLING RADIOACTIVE IODINE

I WOULD like to have Dr. Glasser say a word about the protections that are necessary, not to the patient, but to the people who handle this radioactive iodine. It must be done by a physicist who has had training comparable to Dr. Glasser's, or by roentgenologists who have had the requisite training. Dr. Glasser has run the emanation plant at the Cleveland Clinic for twenty years and his hands, which are just as normal as mine, bear witness to the fact that he knows how to handle radioactive substances.

DR. OTTO GLASSER: I would like to sound a word of warning here in regard to the use of these radioactive substances. The treatment itself looks perfectly innocent and simple. You get the material in a colorless liquid form in a bottle and it seems to be perfectly simple to dilute it in a glass of water and have the patient drink it, but you must never forget that these isotopes emit beta and gamma rays and that you have to protect yourself, your personnel, and the patient against undesirable irradiation. You have to use at least the same precautions you use with all radioactive substances.

We have set down a dose of 0.1 of 1 r a day that a person should receive if he is not to be damaged. This is an exceedingly small dose, as you can well imagine, and you have to be sure that whenever you handle these substances, this dose which your body absorbs should not exceed 0.1 of 1 r per day. In order to achieve this standard, you use all the precautions one is used to in the handling of these substances. Keep as far away from them as possible. If you have to handle the isotope, use a holder with a long handle so you keep the glass of iodine as far away from you as you can. The patient can hold it because he does it only once or twice. All other precautions, such as lead-lined gloves, lead-lined aprons if they are required, and so forth have to be taken into consideration.

As I said, be sure that if you use radioactive isotopes you consider the danger inherent in handling these substances.

DR. CRILE: I think, in conclusion, it would be worth while to summarize this whole matter. We must evaluate what can be done by all of these various methods at our disposal in the treatment of hyperthyroidism.

First, what can be done by thyroidectomy? We know that following operations for Graves' disease the incidence of recurrent hyperthyroidism and postoperative hypothyroidism is 5 to 10 times as high as it is after operations for nodular goiter with hyperthyroidism. There is practically no morbidity associated with operations for nodular goiter with hyperthyroidism. It almost never recurs if a proper operation has been done, and hypothyroidism is extremely rare. With Graves' disease, however, the reverse is true and complications do occur.

Propylthiouracil has proved to be as safe as we anticipated, and it has been effective in patients who have mild to moderate hyperthyroidism and small goiters, who respond well to the initial treatment, whose thyroids do not enlarge under treatment, who are intelligent enough to follow through with treatment, and do not develop side effects. In that group it has produced long-standing remissions in over 50 per cent of the patients whose hyperthyroidism has been completely controlled for one year.

There are failures in this group, however, and it is these failures, the patient who refuses surgery, the patients in the older age group, whether the goiter be nodular or whether Graves' disease is present, and finally those with recurrent hyperthyroidism in whom we feel that radioactive iodine has its chief use. I believe that if we reserve it for the present for those groups we can continue as we go along to evaluate its safety. Later, if its safety is established and if no late complications appear, its use will be applicable to younger individuals.

Diagnostic Clinic

Present Day Rectal Diagnosis

DOUGLASS PALMER*

CORNELL UNIVERSITY MEDICAL COLLEGE, NEW YORK

THERE is probably no field of medicine in which more errors are committed and in which there is more delay in diagnosis than in the field of rectal diagnosis. The great difficulty is not in the interpretation of the findings after the examinations are made, but in convincing physicians that the examinations must be made.

One man who has devoted his whole life to teaching has said, "You must see the instrument passed for at least a year before making the examination yourself. The man not doing proctoscopy all the time wouldn't know what he is looking at." I shall try to show that this is not necessarily so. When I was teaching at Cornell I had the men pass the proctoscope the first day.

I do a proctoscopic examination on practically every patient who comes to my office, whether he has symptoms or not, and I believe it is a very simple procedure. It takes only a minute or two—not as much time as is required to examine the lungs. In the majority of cases I pass the instrument a full 10 inches. (There are longer ones.) If there is any pathology present you are willing to spend the time to find it, even to have the patient return for another visit.

As an example, there was the case of a Mexican woman who was in an Atlantic City hospital. Pneumonia was suspected. Her lungs were x-rayed, her sputum was typed, she had all the laboratory tests. The diagnosis was pneumonitis but not definite pneumonia. She left the hospital and came to New York where, upon entering the French Hospital, she was found to have a large ischiorectal abscess. It is incredible, but this is a true case.

I suppose this is a sort of negative way of presenting the subject—making errors in diagnosis the subject of what one has to say, but at any rate I do not do what many men do—call any case of rectal bleeding hemorrhoids and treat them with suppositories. I ask if there is bleeding, if there is change in bowel function, pain, and if any of these symptoms are present I may elaborate on them. I always plan to ask the patient if he is in general good health, because I do not want to be treating some minor rectal condition and find there is serious pathology elsewhere. Then follow with palpation of the abdomen and note what the findings are. Next the patient is put in the left lateral Sims' position to see whether there are polyps, hemorrhoids, fissure, and so on.

I shall not go into detail other than to say that on inspection carcinoma of the rectum is very rare.

On palpation, one finds spasm, papillae, hemorrhoids, abscesses, impactions. Impactions are quite unusual, but I saw one case in which a woman had had a large impaction for three years. Circular concretions had been formed, and she had been told she had a carcinoma and was left to die. The impaction was removed.

One patient, a man, had a gallstone, a ball valve impaction. Whenever he took an enema he would start to expel it and it would suddenly stop. I examined him in my office, giving him an enema. With the man on the toilet I put my finger in the rectum so as to miss nothing, and I felt the impaction, which I said was a gallstone, although I

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had never seen one. I gave him a local anesthetic and removed the stone. The payoff came when the man took the gallstone up to the Bronx to show his friends and later came back on a second visit to show much more; in the meantime I had cut the impaction in half; it was a pure cholesterol gallstone coated with fecal matter.

Sometimes you will get pelvic pathology. I had one case of impaction which I thought was a tumor of the ovary, and later at operation it was so found.

One case of bleeding and pain after defecation which was due to fissure, was diagnosed hemorrhoids as are many other things. Fissure is a very small lesion that is extremely painful and many times is accompanied by internal piles, and at the upper end of the lesion inside the rectum there are papillae. Spasm is often so great that one is unable to make a proper examination until at the time of operation.

A male patient who had complained of rectal pain for ten years or more, was given a complete examination and told his prostate was affected. He had over 100 prostatic massages. On rectal examination it was found that he had a blind posterior abscess cavity with pus, and the trouble was relieved as soon as he was treated surgically.

Palpation should be all the way around the rectum. One well-known younger urologist and a good friend of mine asked me if I would see his patient. The man came to the office with a well-greased rectum, and on palpation I found that he had a large carcinoma of the rectum which my friend had missed. When I told him what had happened, he said that never again would he examine the prostate without running his finger all the way around the rectum.

On another occasion I examined a patient for a well-known medical man. The patient had a carcinoma of the rectum, and when I told the physician, he said his finger was too short, that he couldn't feel it. Two years later the same man asked me again to see a patient. The same findings were developed, and again he told me that his finger was too short.

Proctoscopies are really very simple matters. I think the principal reason some people have difficulty is that when they insert the proctoscope in the rectum, they strike one of the valves, and push in. If, instead of pushing in, they would work the instrument laterally, back and forth, they would very soon strike a semilunar bit of tissue; then they can put the instrument very easily beyond and go on up to the rectosigmoid. At the rectosigmoid, the narrowest part of the valve, and from there on, one has to use pressure. Assuming that you are examining in the lateral position, you bring the outer end of the instrument backward, the other part goes forward, and with slight changes in position, you can pass the instrument all the way in.

If a patient is too old or debilitated or is a cardiac or very obese, you have to use the Sims' position. If you do it in all bed patients, then why not all the time?

Of course, it is very important to remember that you can damage the patient. I am not saying that you should not be very careful. When you pass the rectosigmoid there are about 15 cm. where one may get a sharp angulation of the bowel, and it is well for a man to know when to stop.

What does one see in a proctoscopic examination? Seventy per cent of all rectal tumors are either seen through a proctoscope or felt. When it comes to choice of procedures, don't pass the buck to the x-ray man. One sees blood from above, polyps, multiple polyposis, ulcerative colitis, amebiasis, and so on. I did not expect to have a case of amebiasis here, but they rustled one up for me and I will present him in a moment.

In 1913 I had a patient, an engineer, who contracted amebiasis in the city of Cleveland in Ohio. He had a bloody dysentery for a year. I tried to find out about the case a year ago and I got just an ordinary printed form saying they did not know about it. When I came in here I spoke to Mr. Duncan, and he said that was before the days when they knew how to diagnose them and it was also before the days when the crib or the breakwater had been constructed, and the drinking water was taken from very near the shore. This man had diarrhea for a year. He then moved to New Haven and had just moderate ill health.

In 1945, twenty-seven years later, the patient developed what was supposed to be influenza, and five days later he developed a liver abscess. He was operated on by one of my friends in New York Hospital and was found to have an abscess which was recognized as amebic, and was treated with emetine. In my experience emetine is the surgeon's answer to amebiasis and is the greatest aid in stopping symptoms. But a year later he came to me and I found that he had cysts, pre-cysts and multiple amebae.

I get amebiasis into this story on the basis of the proctoscopic picture where there are active amebae. In those cases that we saw coming from Chicago after the epidemic in 1933 and 1934, many times my technician would verify the diagnosis before I had removed the proctoscope from the patient's rectum. Active multiple amebae containing red blood cells would clinch the diagnosis. In the more difficult, more chronic, and more important cases one has to examine the stools and find the encysted forms, and there is where the difficulty arises.

A Dartmouth football player took a trip around the world and somewhere around the Yellow Sea or some other place contracted an active bloody dysentery with all the symptoms. He stopped in Calcutta and Alexandria, I believe, and was unable to get any help. He then went to Boston where he saw four or five different doctors. One man sent him to the Massachusetts General Hospital where a single stool was negative. He went to a very distinguished Boston doctor, who happened to be ill and whose assistant did not take him seriously. He then entered a large and distinguished New England clinic where he spent fifteen days, and I have a full page report. Strangely enough, it said there were four examinations for amebiasis which were negative.

He came over to see me, and just by looking and making an examination we found that he had amebiasis. No man who has been in the Far East, who has had a sudden attack of bloody dysentery with all the symptoms that go with it, should be turned aside without a very careful examination.

I also saw an airplane salesman who had been in business in China who contracted both amebiasis and malaria. He went to a large midwestern clinic. He was given a clear green light, and two weeks later he was in my office with bloody dysentery. We found that he had cysts, pre-cysts, and active amebae. That does not mean that he had an active dysentery when he was at the clinic, but it shows that he still was infested with cysts.

I have one pet theory based on the fact that all men agree that 70 or 75 per cent of colon lesions can be diagnosed by the finger or the proctoscope.

Table 1 comprises an x-ray report on 25 barium enemas given at New York Hospital, all of which were negative for pathology. There were diverticuloses, megacolons, enlarged bowels, and so on. One man was supposed to have diverticulosis. After eight months he returned to the hospital for resection. For some reason or other they asked me to see him, and it was a simple matter to take a biopsy specimen which proved to be carcinoma. He then decided to go across the street to be operated on, and was found to have inoperable carcinoma of the rectum.

TABLE 1

REPORT OF 25 BARIUM ENEMAS

1. Negative	Lymphosarcoma, palpable. Biopsy
2. Negative	Palpable carcinoma of rectum
3. Negative	Biopsy. Adenocarcinoma of rectum
4. Negative	Biopsy. Carcinoma of rectum
5. Negative	Biopsy. Palpable carcinoma of rectum
6. Diverticulosis	Palpable tumor; large adenoma
7. Negative	Palpable adenocarcinoma of rectum
8. Negative	Palpable carcinoma of rectum (not N.Y. Hosp.)
9. Negative	Palpable carcinoma of rectum
10. Negative	Adenocarcinoma, rectosigmoid
11. Negative	Adenocarcinoma. Inoperable at exploration
12. Negative	Adenocarcinoma. Hemorrhoid operation two months before
13. Negative	Large polyp
14. Diverticulosis	Adenocarcinoma of rectum
15. Negative	Biopsy. Carcinoma of rectum
16. Negative	Palpable carcinoma of rectum
17. No pathology	Palpable carcinoma of rectum
18. Negative	Palpable carcinoma of rectum
19. Redundant colon	Palpable carcinoma of rectum
20. Negative colon	Stricture, T.B.C.
21. Diverticulosis	Adenocarcinoma, rectosigmoid (inoperable)
22. Negative	Carcinoma, rectosigmoid
23. Large bowel fills without defect	Large papillary tumor
24. Negative colon	Palpable polyp
25. Negative	Biopsy. Large precarcinomatous polyp

A PATIENT I have just seen has amebiasis and presents several interesting phases. He contracted amebiasis in Liberia in 1945. He was adequately treated there and in 1947 he was found to have a negative stool examination but a positive complement fixation test. This year in Cleveland (he has been a patient at the Veterans' Clinic) he had a negative complement fixation test but positive stool examinations. Three tests showed both multiple amebae and cysts. At the present time he has no amebiasis, but only within the last two weeks has he been symptom-free.

An interesting thing in his case is that both he and his wife have had dysentery of a mild type. He lives on a farm and two weeks ago or so he stopped boiling the water. The question is whether he still has an infestation. I think he probably has been cured. In my experience I have never had any cases of amebiasis that did not respond to treatment. That is contrary to the general reports in the literature.

One man recently wrote in one of the journals of some 230 cases of amebiasis among soldiers and some 700 among civilians, and these cases were practically all cured. He found no difficulty in giving emetine without poisoning, and the patients were cured by a combination of emetine and diodoquin.

This man, I imagine, is still free from amebiasis, although there is no question that he had either a recurrence or did not respond to adequate treatment in 1947.

I did not expect to have a clinic case, so I have not dealt with carcinoma of the rectum per se. It really does not take very much time to diagnose or talk about cancer of the rectum. Given a person with symptoms, this is about all one needs, with a willingness to put on a finger-cot and examine the rectum. I have a finger-cot with me. I buy my cots in Ohio at a place called Talmadge for a dollar a gross, so you can easily get them. Put the finger in the rectum and turn it around so as to get the prostate as well as the hollow of the sacrum, and that is generally enough. If that does not suffice use the proctoscope, and in the 20 or 25 per cent of the cases that are left you will have to do a barium enema.

I trust that a large number of you, if you do not already do them, will make rectal examinations. Get a history, look at the anal region, palpate to determine if there is a carcinoma, which is the most important thing to know about. Use your proctoscopes.

Fabricus lecturing in the Aula of the University of Padua.

Case Report

Social Adjustment Following Transorbital Lobotomy

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The transorbital approach to the frontal lobes had been utilized for several years prior to the development of prefrontal lobotomy by Moniz[1] in 1936. Dogliotti[2] had designed a needle which could be tapped through the superior orbital plate in such a manner that ventriculography could be accomplished, and the transorbital route had been used in the intracerebral inoculation of malaria.[3,4] Therefore, it is not surprising that Fiamberti[5] introduced the transorbital modification of the work of Moniz as early as 1937. The operation was performed by Fiamberti and later by Rizzatti and Borgarello,[6] mostly on chronic schizophrenics. The results were not particularly good, but they are now understandable when viewed in the light of the work of later investigators, particularly Freeman and Watts,[7] showing the deteriorated schizophrenic to be a very poor candidate for psychosurgery.

Kalinowsky and Scarff[8] outline a definite program of therapy at the onset of a schizophrenic illness and follow through without delay. They feel that the potentialities of the various shock therapies will be exhausted before the end of a year, and, if the patient remains unimproved, lobotomy should be considered at that time. To wait until the patient is hopelessly deteriorated is considered by them to be a most regrettable error.

In evaluating frontal lobe function as revealed by their experiences with prefrontal lobotomy, Freeman and Watts[9] noted that, providing the psychosis was relieved, a correspondingly better result was obtained the more anterior the section was made. Also, they concluded that the personality changes following operation were responsible for some of their failures. The personality changes which might occur after prefrontal lobotomy must be weighed against the severity of the patient's symptoms and because of these possibilities operation is not advisable in certain cases.

Freeman[10] became interested in transorbital lobotomy in an attempt to find a therapy for patients with discouraging prognoses, in whom a major lobotomy might be contraindicated. After cadaver studies and after clinical trial on about 100 patients, he concurred with Fiamberti's opinion that transorbital lobotomy could be performed safely by the neuropsychiatrist.[11,12]

Freeman's modifications made the operation still more simple. In his method, an instrument resembling a dull pointed ice-pick is tapped through the superior orbital plate into the frontal lobe to a depth of 4.5 cm. while the patient is unconscious following an electroshock convulsion. The instrument, fixed in the dome of the orbital vault and held parallel with the bridge of the nose, is moved slowly through an arc of 30° and then withdrawn. Another postconvulsive coma is produced for the performance of the operation on the second side. One of the reasons that the operation is simple is that no preparation of the operative site is necessary, the sterile instrument being placed into a normally sterile conjunctival sac.

Freeman's preliminary report contained 10 cases, 9 of which were followed for two years after the operation. The tenth patient died of pancreatic carcinoma after twenty months. Of the 9 living patients, 4 were evaluated as having a good result, 4 as having a fair result, and 1 as having a poor result. In a later evaluation of 33 patients, it was determined that one-third of the schizophrenics and one-half of the involutional cases had responded well to the combination of transorbital lobotomy and electroshock treatments.

Fernandez-Morán,[13] Haas and Williams,[14] and Jones and Shanklin[15] have reported favorably on

FIGURE 1. Photograph of L. B. on March 16, 1947.

the use of transorbital lobotomy in institutional practice and have demonstrated that the operation can be performed safely by the psychiatrist.

Dr. Walter Freeman introduced transorbital lobotomy to Western State Hospital in August 1947, and recommended certain criteria for case selection. The following case of catatonic schizophrenia, originally given the diagnosis of manic depressive psychosis, manic type, was the first selected for operation after Dr. Freeman's visit.

CASE REPORT

L. B., a 36-year-old white male, was admitted to Western State Hospital in restraint and under heavy paraldehyde sedation, on March 16, 1947 (Figure 1). He had been perfectly well until about February 1, 1947, when he began to talk about fortune hunting and ways of getting rich quick. Commitment occurred because he had threatened to kill his wife and a neighbor. He had the idea that he and the neighbor had discovered a pot of gold and that the neighbor was trying to steal it.

He was born October 22, 1910, in Clearwater, Nebraska, the last of 15 children. There were no neuropathic traits in childhood other than enuresis until the age of 9 and somnambulism into adolescence. After he graduated from the eighth grade at the age of 16 he remained on his father's farm until the age of 26 when he married a woman six months his junior whom he had known for many years. At that time he changed from the Lutheran to the Catholic religion. Shortly after marriage he moved to ———, Washington, on a resettlement farm. This did not prove to be as ideal as he had been led to believe and the venture was given

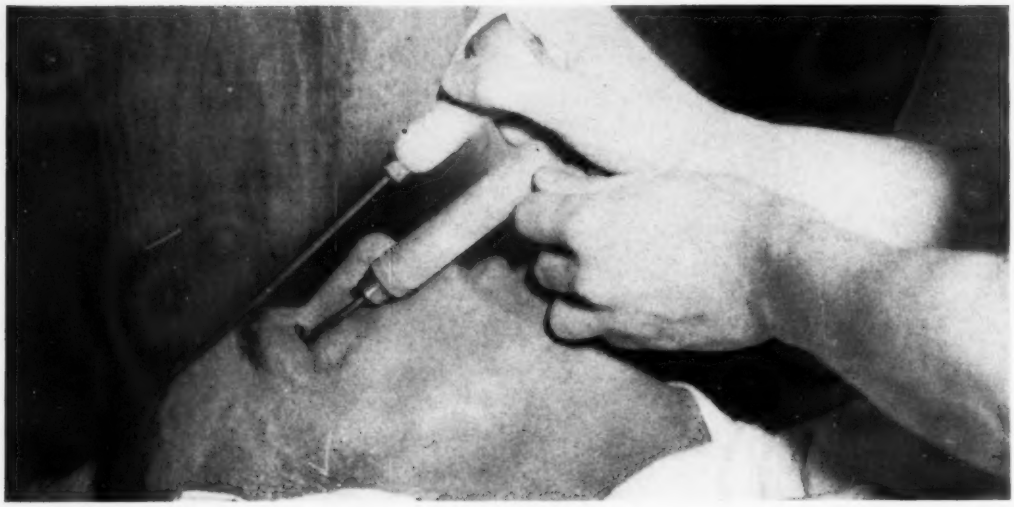


FIGURE 2. Photograph of transorbital lobotomy on L. B. The upper instrument helps determine the position of the tip of the lower.

up after three years. Then he moved his wife and child in a trailer home to ———, Washington, where he began contracting to white-wash dairy barns. He remained in that business four years, the last three months of which he worked on salary for the State Department of Health. Off and on he has worked in the lumber industry and he worked the winter of 1946-47 in a saw mill.

He was on the first day of a job for the State Forestry Department, planting trees, when his illness was noted. According to his wife the only stress he could have suffered was that he was worried financially. There were 4 children, ages 1, 3, 7, and 10. As the family increased in size he was able to move from the trailer home to a permanent building.

During the first week in the hospital he had episodes of extreme noisiness and assaultiveness. One night he jumped up suddenly and knocked out seven window panes, severely lacerating his hands. He was unable to explain the action, saying that he was confused and didn't know what he was doing. He was generally hyperactive and was seen flinging his arms, walking up and down, talking and shouting.

Often he feigned blindness, putting his hands over his eyes and saying, "Lead me, I cannot see." When asked to give an account of himself he said, "I don't know how I got here. At first I thought I was in Russia. I tried to look and see where we were going but I don't know the way home." He was grandiose and euphoric. "I can whip any of the fellows here, in fact I could even whip Dempsey, Gene Tunney, or maybe Joe Louis. I've got more power than I ever had before."

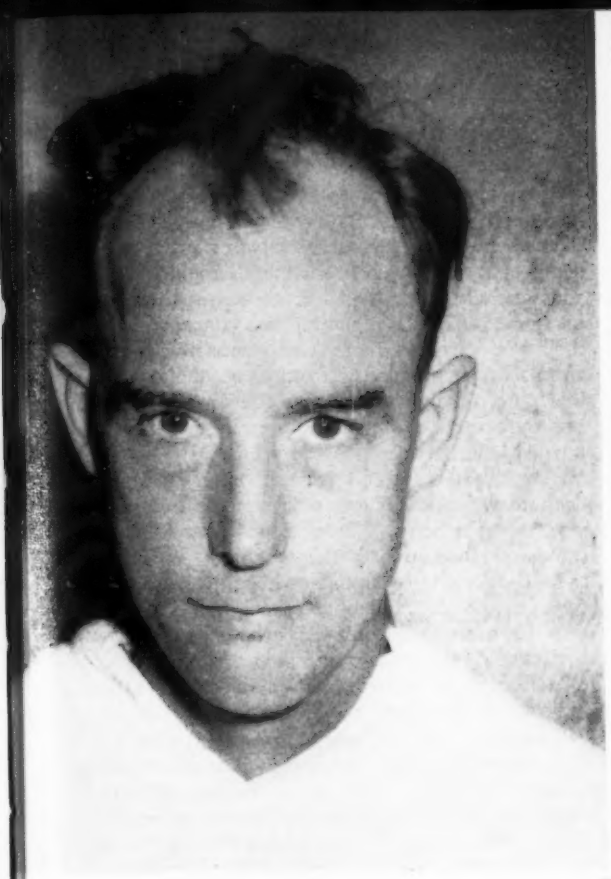
The idea concerning the "pot of gold" changed somewhat. He stated that it was really uranium and that it was worth millions of dollars. However, he denied that anyone was trying to steal it. Insight was lacking. "My mind is just as clear as a bell now, I can think and think and think."

From March 20 to July 16, 1947, he received 29 electroshock treatments divided into four courses with temporary symptomatic improvements. He became increasingly preoccupied with religious matters. On August 31, 1947, he again became disturbed and confused, trying to jump from a third story window. He kicked an attendant in the shins and tried to force his way out the door of the ward. Following this episode he became apathetic and seclusive. Frequently he would burst out crying but he was not depressed. These attacks of crying would terminate as suddenly as they started. He began to show mild grimacing and gesticulation. He admitted to being able to converse with the Lord in his own mind. It was the voice of the Lord he had heard on the day he found the "metal of value." The Lord directed him to the spot and told him to dig.

Although the schizophrenic nature of the illness had gradually become recognizable insulin coma therapy was not available at that time.

Transorbital lobotomy was performed on September 11, 1947, in the late afternoon (Figure 2). He conversed freely within thirty minutes after the operation. Restlessness and the physiologic components of tension were no longer present. The following morning he dressed himself, ate in the dining room, and spent part of the day up and about the ward. As days passed he became more and more friendly and mixed well with the other patients. No episodes of crying occurred. He became affable and mildly euphoric.

When asked why he had come to the hospital he replied that he had found a stone which he considered to contain a metal of value, possibly platinum, and that he had gone to his priest about it. He spontaneously continued that he didn't know whether the stone was of any value or not, that maybe it wasn't, but that he really thought so at the time. On the second postoperative day he wrote a logical letter



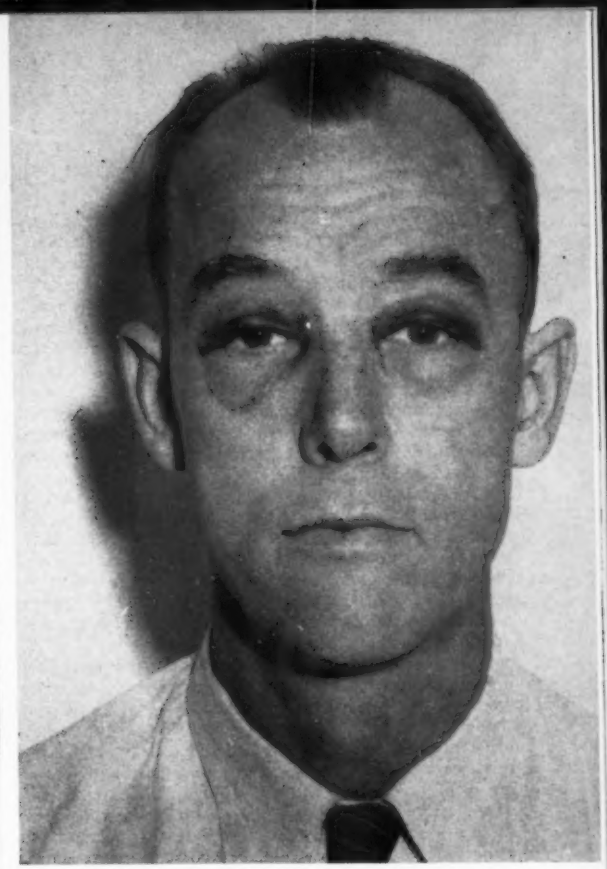


FIGURE 3 *(upper left)*. Photograph of L. B. on September 11, 1947.

FIGURE 4 *(upper right)*. Photograph of L. B. on September 13, 1947, two days following operation. Note degree of periorbital ecchymosis.

FIGURE 5 *(right)*. Photograph of L. B. on September 20, 1947, nine days after transorbital lobotomy.

home whereas he had been unable to do so before. He was paroled September 21, 1947, ten days after the operation.

Monthly letters have been received from his wife since parole. She wrote in October that at first he was quite shy in public but later would go to town and do business in what appeared to be a normal way, except that perhaps he wouldn't talk as long to acquaintances as before. A few episodes of confusion and crying were mentioned in her first two letters. Before he left the hospital his wife obtained a small farm and he began doing chores as soon as he arrived home. Also he took a truck apart and gave it a successful overhauling. He began to read newspapers and discuss current events with his wife.

In January 1948 the patient's wife commented that she thought he had shown a marked improvement. "His judgment seems to be better; also his use of reason and understanding are more sound." He obtained a job working on a lumber dock in January and worked every day except one for six weeks when the work was completed. Later a farmer hired him to put in the spring crop using a tractor. On these jobs he was accepted well by his fellow workers.

By March 1948 his wife wrote that she felt he was nearly normal in every way. He was kind to his children but more strict than before hospitalization. She could see some changes in him but these she regarded were for the better. He seemed unconcerned about small details and was apt to misplace his hat, etc. Post-electroshock confusion concerning events preceding the psychosis slowly subsided. His wife wrote last month: "Before, when he had his mind on something it seemed he couldn't occupy himself or settle down until it took place but now he goes on from day to day just in a common manner, not tense. If he is worrying he certainly is fooling me." In recent months he has had steady, full time employment in a pulp mill.

COMMENT

Transorbital lobotomy differs sharply from standard trephine procedures in two major respects. First, the operation is of such a nature that it can be performed safely by the psychiatrist and second, its postoperative state is not characterized by the personality defects occasionally seen following prefrontal lobotomy. Universal familiarity with these two points should result in making psychosurgery available to a great number of patients who might not otherwise be considered for therapy or who might not have the opportunity to receive an operation.

In discussing transorbital lobotomy Freeman[11] writes: "It has been particularly gratifying to find excellent preservation of normal personality patterns. Patients have been tested rather thoroughly by a variety of methods, and it may be categorically stated that none of the inertia, indifference, indolence and so on have been manifested; nor has there been the tactless, explosive, or outspoken behavior noted so frequently following prefrontal lobotomy. The patients are apparently entirely themselves, with normal capacity for meeting social situations in an adult manner. Sometimes their adaptation is better than it ever was in their prepsychotic state, since they are less concerned with their own ideas, are more readily accessible to new approaches, and are freed from preoccupation with the future or the past."

Although there are many cases in the series of 54 at Western State Hospital which give a more informative picture of a patient before and after operation, the present case was selected to emphasize a single point. Namely, that from a social standpoint the patient is able to support his family as well after the operation as he did before. The question most frequently asked by physicians about transorbital lobotomy is whether or not the patient's social behavior is impaired. No impairment has made itself evident in the postoperative progress in this instance.

Even though a comparison of Figure 3 with Figures 4 and 5 shows visual evidence of decreased tension, the present case is not offered with the suggestion that transorbital lobotomy was responsible for the change for the better. The efficacy of the operation can be determined by extensive clinical experience at the bedside and somewhat by statistical analyses of a number of large series. However, as Hebb[16] has pointed out, a single case is often very adequate to demonstrate the least amount of functional change resulting from a brain operation, particularly when the exact extent of the operation is known and the possibility of concomitant dysfunction ruled out.

From an anatomic standpoint the incision of transorbital lobotomy appears to undercut Brodmann's areas 9 and 10, the cortical areas which have been removed by the operation, topectomy, without personality impairment.[17,18] The afferent and efferent connections of a portion of these areas are disrupted. The remaining pathways of the frontal lobes are not involved.

That no impairment of personality occurs is consistent with the recent studies of Clark[19] and of his colleague Russell.[20] Clark points out that anatomic studies of lobotomized brains show a great part of the frontal cortex to be an afferent projection area comparable with the visual or auditory areas of the cortex. Also, he states there is no anatomic evidence to support the popular conception of the frontal cortex as an association area primarily concerned with the reception of impulses

from other cortical areas. Russell points out that memory and the basic patterns of adult behavior and intelligence apparently have their center in the temporoparietal area of the dominant hemisphere. He suggests that much of the work of the frontal lobes in conditioning and molding the pattern of behavior responses is completed by early or middle adult life.

That the behavior of the mature adult may show very little impairment following prefrontal lobotomy might lead to the conclusion that the early patterns of behavior impressed by the frontal mechanism during mental development persist after operation. To carry Russell's hypothesis a step further, one might use it to explain the clinical failure of prefrontal lobotomy in some chronic nondeteriorated schizophrenics. Here it would seem that the pathologic emotionality of the psychosis might have succeeded in impressing persistent pathologic behavior responses in the temporoparietal area.

Unfortunately the battery of psychologic tests now being used before and after transorbital lobotomy at Western State Hospital was not given to L. B. The results of present work, which will be reported at a later date, indicate no demonstrable psychologic impairment following the operation. However, this single case, which is typical of a fair percentage of the successful cases of the series, shows that for all practical purposes transorbital lobotomy did not result in personality defects discernable by the patient's wife or friends. It is true that she noted a few changes from his premorbid personality such as a different attitude toward the children and the tendency to be inattentive to small details. But these changes cannot be regarded as liabilities or as deviations from acceptable behavior of persons with no history of psychosis. Initially she was more concerned that certain features of the illness lingered. Later she was very happy to see them fade.

One might question her competency to evaluate his mental status correctly. To assure myself on this point I spent the afternoon with the patient at his home on one of his days off in September 1948. He showed no evidence of psychosis. Especially gratifying to me was his tendency to project current problems into the future and to express logical, confident plans for overcoming these problems.

Actually the object of performing transorbital lobotomy is to produce a change. The change desired and often obtained is the replacement of psychotic behavior by nonpsychotic behavior. The premorbid personality upon which the psychosis rests may be changed somewhat in successful cases. Perhaps this improvement might constitute a new measure of protection against subsequent psychotic episodes.

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GENERAL PRACTICE *Review*

To provide the general practitioner, as well as the specialist with concise, readily available information on the latest, proved methods of treatment of conditions commonly encountered in an average practice, POSTGRADUATE MEDICINE *offers this department to its readers. It is not, of course, intended to present these discussions as the only acceptable therapeutic procedures to be used, but rather to offer simple regimens and recommendations based on the extensive experience of the physicians who prepared these summaries.*

Treatment of Acute Rheumatic Fever

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MANAGEMENT OF THE ACUTE EPISODE

AFTER the diagnosis of acute rheumatic fever has been established, comprehensive treatment should be instituted without further delay for the purpose of relieving discomfort as promptly as possible and of carrying the patient to a quiescent state with a minimum of residual organic damage and deconditioning.

Complete rest in bed is important during the acute episode and is recommended for an additional period of two weeks after reaching quiescence, which is indicated by complete remission of all physical and laboratory evidences of activity. The purpose of such rest after joint pain is relieved is to reduce cardiac load to a minimum and to avoid reactivation of the disease by exertion.

A program for obtaining optimum physical rest and a reasonably happy adjustment to such a state will vary from individual to individual. In some cases bathroom privileges and the occasional use of a bedside chair will transform a tense, disturbed patient to a relaxed and cooperative one. Rather extensive studies conducted during World War II in connection with the Army Air Forces Rheumatic Fever Control Program indicated that such concessions did not result in harm nor in delayed convalescence.

Salicylate therapy, at least for now, remains the drug of choice for the control of joint manifestations and fever. It should be administered to the point of tolerance as indicated by slight ringing of the ears with or without slight deafness and continued for one week after quiescence has been achieved. The usual dose when sodium salicylate is used ranges from 5 to 15 gm. daily in the adult with proportionately less in children. Sodium bicarbonate and other alkalies tend to lower the blood concentration obtained with a given dosage but often are of value in controlling gastric irritation and possibly other toxic manifestations. Aspirin may be substituted for sodium salicylate with comparable results. Sodium salicylate may be administered intravenously but the greatly increased incidence of serious reactions without any definite evidence of added effectiveness contraindicates this method for routine use. Occasionally the use of vitamin C in doses of 100 to 200 mg. daily will result in a beneficial increase of tolerance to sodium salicylate.

Mild reactions to salicylates consisting of gastric irritation, tinnitus, deafness, and coloring of vision

occur frequently and are of little significance. They can be controlled by manipulation of dosage of the salicylates and the use of an alkali. Occasionally quite severe reactions are seen. These may be manifested by shaking chills, acute psychosis with incoherent speech, disorientation, accelerated pulse, air hunger. These should be treated by the intravenous administration of large amounts of lactate, Ringer's solution and dextrose and by the cessation of salicylate therapy.

Other drugs should be mentioned briefly. Amidopyrine has been recommended by Homer Swift as being effective and well tolerated. The dosage required to relieve symptoms ranges from 20 to 45 gr. daily. If this drug is used adequate precautions must be taken from the standpoint of secondary agranulocytosis. Sulfonamides and penicillin have no place in the therapy of acute rheumatic fever and appear at times to increase the severity of the disease.

The recent beneficial use of Cortisone and ACTH (adrenocorticotropic hormone) in a few cases of acute rheumatic fever gives hope that truly specific agents have been found which not only will favorably influence the temperature and polyarthritis but which may also reverse the acute cardiac manifestations of this disease. A complete evaluation of the role of these substances in the therapy of acute rheumatic fever must await further investigative effort.

Other general measures in the treatment of this disease should not be neglected. During the period of acute joint pain much relief may be obtained by supporting the joints with pillow splints or occasionally splints or light casts. When the lower extremities are involved, a cradle to support the bed clothing is helpful. In occasional cases the pain may be so severe that codeine or morphine will be required for brief periods.

A liquid or semisolid diet is advisable during the acute stage and the fluid intake should be adequate to supply body needs and replace that lost by perspiration. An adequate diet both qualitatively and quantitatively should be supplied at all times. Precordial pain may be relieved by an ice bag or, if severe, opiates may be required.

Congestive failure developing during the acute phase of rheumatic fever is not uniformly responsive to digitalis and perhaps may best be managed by the use of a low salt diet (200 mg. sodium daily) with xanthine or mercurial diuretics. A large fluid intake of distilled water should be encouraged. If a satisfactory response does not follow these procedures, digitalis should be given.

The psychogenic management during the acute phase—Early in the course of World War II it was observed that as many, or more, of Air Forces personnel were being discharged to civilian life following rheumatic fever for psychosomatic residuals than for organic sequelae of this disease. This emphasizes the fact that, while careful medical supervision is essential, it should be done unobtrusively and the patient's attention not unnecessarily directed to the heart by excessive auscultation and other diagnostic procedures. The necessary cooperation from the patient should be obtained by other means than by the threat of dire things to come. An anxiety neurosis may prove just as disabling and far harder to manage than a damaged mitral valve.

CONVALESCENT CARE

After quiescence has been achieved as indicated by the complete disappearance of all physical and laboratory evidence of the disease and with no sign of recurrence after the patient has discontinued salicylates or other specific treatment for one week, physical rehabilitation of the patient may be undertaken. There seems to be no value of further physical rest after this point has been reached and it is imperative to halt the deconditioning and psychologic damage associated with complete rest.

The extent and rapidity with which such reconditioning may be undertaken depends upon the condition of the patient and obviously will not be as rapid if evidence of residual valvular disease is present, although there is no evidence that further injury or an increased incidence of reactivation results in such cases from a rational reconditioning program. Such a program of exercise should be progressive in character and should not be permitted to go beyond the point of excessive fatigue or increase in pulse rate but should be rapidly increased as the tolerance of the patient permits. By such a program many patients will be completely rehabilitated within two to four months after the onset of the acute attack.

Prevention of recurrences following the acute episode—It is recognized that an acute episode of rheumatic fever renders the individual more susceptible to subsequent attacks and that in general the likelihood of and the severity of the organic residuals will parallel the number of acute episodes occurring in the individual case. Therefore, an important part of the management of the convalescent period consists in the prevention of such recurrences. Since it is believed that acute rheumatic fever results from a physiologic disturbance created by an infection of group A hemolytic streptococci, the prevention of recurrences is thought to depend upon the prevention of such infections. There is considerable evidence that this may be accomplished by sending the patient to an area of low inci-

dence of streptococcic disease for several years or until the period of greatest susceptibility has elapsed.

Great reduction in recurrence rate can also be attained by the routine prophylactic use of antibiotics. The majority of the experimental work with this procedure has been done with the sulfonamides and it appears that 0.5 to 1 gm. of sulfadiazine daily (year around) is an effective procedure in reducing the likelihood of recurrences. Oral penicillin in doses of 50,000 to 100,000 units by mouth at bedtime has also been reported as effective.

It is possible that some of the newer antibiotics which are more completely absorbed from the gastrointestinal tract and excreted more slowly than penicillin will prove even more suitable. Obviously both the climatic and chemoprophylactic approach can be usefully combined to give even greater protection than can be obtained from either one alone.

CONCLUSION

The beneficial management of the acute rheumatic state depends upon careful attention both to the psychic and the somatic features of this disease. It is hoped that new specific agents now in prospect will make possible more rapid reversal of the pathologic process and thus prevent complications and materially simplify the treatment of the acute episode.

Fracture-Dislocation of the Zygoma and Orbit

JAMES BARRETT BROWN AND MINOT P. FRYER
WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, ST. LOUIS

Fracture or fracture-dislocation of the zygoma occurs in many compound facial injuries. Because of this frequency, and the marked permanent deformity resulting from leaving the bone out of place, a discussion of this one bone and the closely associated maxillary prominence is thought to be worth while.

The prominent anatomic position of the zygoma is probably the reason for its being damaged frequently by trauma. It makes the prominent, hard part of the cheek, forming the front part of the zygomatic arch and the lateral and lower parts of the rim of the orbit. The four main points of attachment from which it is dislocated following a direct blow are: the temporal process which goes back to articulate with the zygomatic process of the temporal bone; the fronto-sphenoidal process, or the upright portion, which joins the zygomatic process of the frontal bone; and then which continues down behind as the orbital process, articulating in a sharp edge with the great wing of the sphenoid; and at a fourth position with the maxilla on its malar surface.

DIAGNOSIS

Fracture-dislocation of the zygoma may be expected in any severe injury as indicated previously. There is usually swelling which may mask the fracture; therefore, knowledge of the type and direction of the blow is important, as this may indicate into what new position the zygoma has been driven. A direct blow from the front drives it backward and downward or outward; one from the side usually drives it inward and down. A blow from the front, in addition to severing the bone from its moorings, usually pushes the zygomatic process backward and breaks it by the bulk of the zygoma itself; however, from the side the fronto-sphenoidal process may be pushed in to encroach on the orbital space.

This change of position of the zygoma, into whichever location it may be pushed, often results in at least one of the four main findings present with its dislocation: (1) obstruction of the lacrimal apparatus, in the duct or sac, by the disruption of the nasal and lacrimal bones; (2) inability to open the mouth, due to the buckling in of the zygomatic arch on the coronoid process; (3) flattening of the malar prominence and enophthalmus; (4) diplopia, because of the drop of the globe with crumbling of the thin-walled antrum, thereby lengthening the orbital cavity.

Physical examination consists of palpation of the inferior orbital border, the main body of the bone, the zygomatic arch, and with the finger in-

side the buccal fornix, displacement may be felt here in severe deformities. The eyes are routinely examined and if there is any evidence of pathology, ophthalmologic consultation is requested. The relative ease with which the optic nerve can be severed by a sharp piece of comminuted bone can be appreciated.

X-rays to show the relative position of the two orbits, zygomas, and maxillae are taken. These are important for confirmation of findings and medicolegal use. A film in the antral position and one to bring out the orbital borders are necessary. The verticosubmental is usually the most helpful. The antrum on the fractured side is usually cloudy from the blood clot.

FIGURE 1. Prominent position of zygoma shown with its four main attachments, heavily outlined. The expected and usual result from a direct blow on the zygoma, with its dislocation and the natural crumbling of the thin-walled maxillary prominence and antrum, might be best appreciated by thinking of the zygoma as a block which is resting on an egg.

The question of **when to do the primary repair** can be answered by the rule of doing it as soon as the patient's general condition permits, in the first twenty-four hours if possible, before infection develops and fixation of the fragments out of position occurs. Shock and brain damage are reasons for delay.

Delay may be considered if there is a cerebrospinal fluid leak, but not always necessarily so. If possible, the delay should not be longer than seven to ten days, since after this length of time fixation is fairly secure and the smaller comminuted chips of bone, as in the antral wall, cannot be gotten into position. It is recommended that "waiting until the swelling has gone down" to find out if fracture and displacement are present not be relied on.

A **direct method of elevation** is often necessary and the most direct approach is through the buccal fornix and on into the inside of the antrum through the fracture line that is almost always present. An incision, 2 cm. long, is made in the buccal fornix above the canine fossa and immediate entrance into the antrum through the fracture line in the antral wall can usually be carried out. Old blood is evacuated with an aspirator. Bimanual reduction of the displacements is then possible, with a Kelly clamp or elevator in the antrum hooked firmly under the angle of the lower border of the orbit, and with the other hand over the border on the outside, the fragments are manipulated into correct position.

If there is marked crumbling and comminution, the heavy ridge of the orbit and the rest of the antrum are molded into shape with preservation of any comminuted fragments along the border. A pack is then accordioned into this thin-walled cavity to act as a splint and support, carefully avoiding perforation into the orbit, so that the best contour and position of the orbital floor and border are maintained. The best pack is a long, 1-inch wide, iodoform gauze, in which has been incorporated balsam of Peru. This pack has its own peculiar odor, but it maintains the odor without becoming foul as plain gauze or plain iodoform gauze does.

This direct approach, in addition to allowing "mulching" and packing the comminuted fragments in place, allows one to elevate the border into place and to hold it stable until solidly healed with the pack in the antrum. Internal wire fixations or pinning may be added in some instances of persistent displacement.

Simple elevation of a fracture-dislocation of the orbital border or the zygomatic process may most easily be done by direct introduction of a

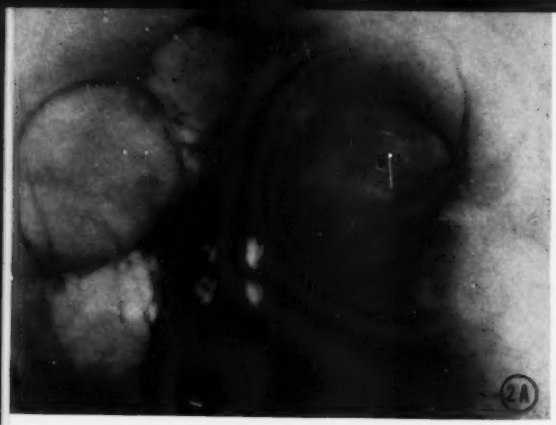


FIGURE 2A. Fracture-dislocation of the zygomatic bone with crum-
bling in of the antral wall and dropping of the orbital borde
B. Appearance when first seen with contusion of eyelid, lacera
tion and flatness of zygomatic region. C. Appearance six month
following reduction. D. Result six weeks following immediate
reduction by direct approach through the buccal fornix into the
antrum.

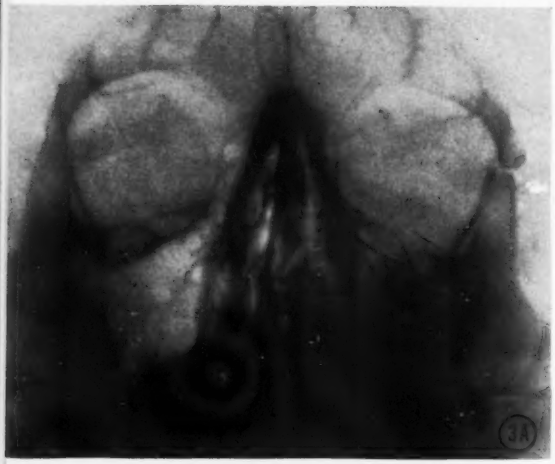
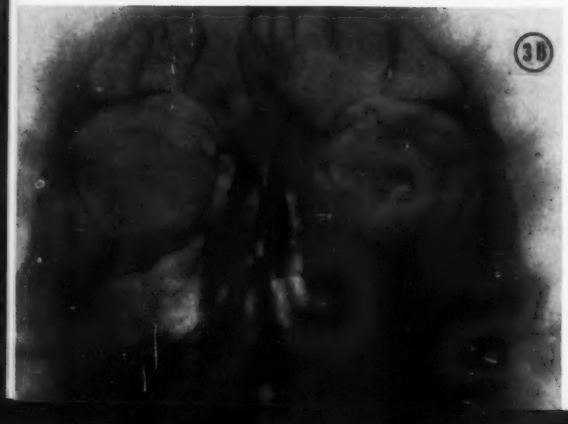


FIGURE 3. Depressed orbital border and flat left side of the face
could be easily seen in C and combined with simple palpation
correct diagnosis and reduction were done. Confirmatory x-ray
A shows what was felt and seen, with zygoma driven over and
down, crushing antrum in. B is an x-ray taken three weeks fol
lowing the immediate direct reduction through the antrum, and
D is a photograph taken shortly after this. Moderate cloudiness
in the antrum usually persists several more weeks but no sub
jective symptoms have been found to be assignable to this.



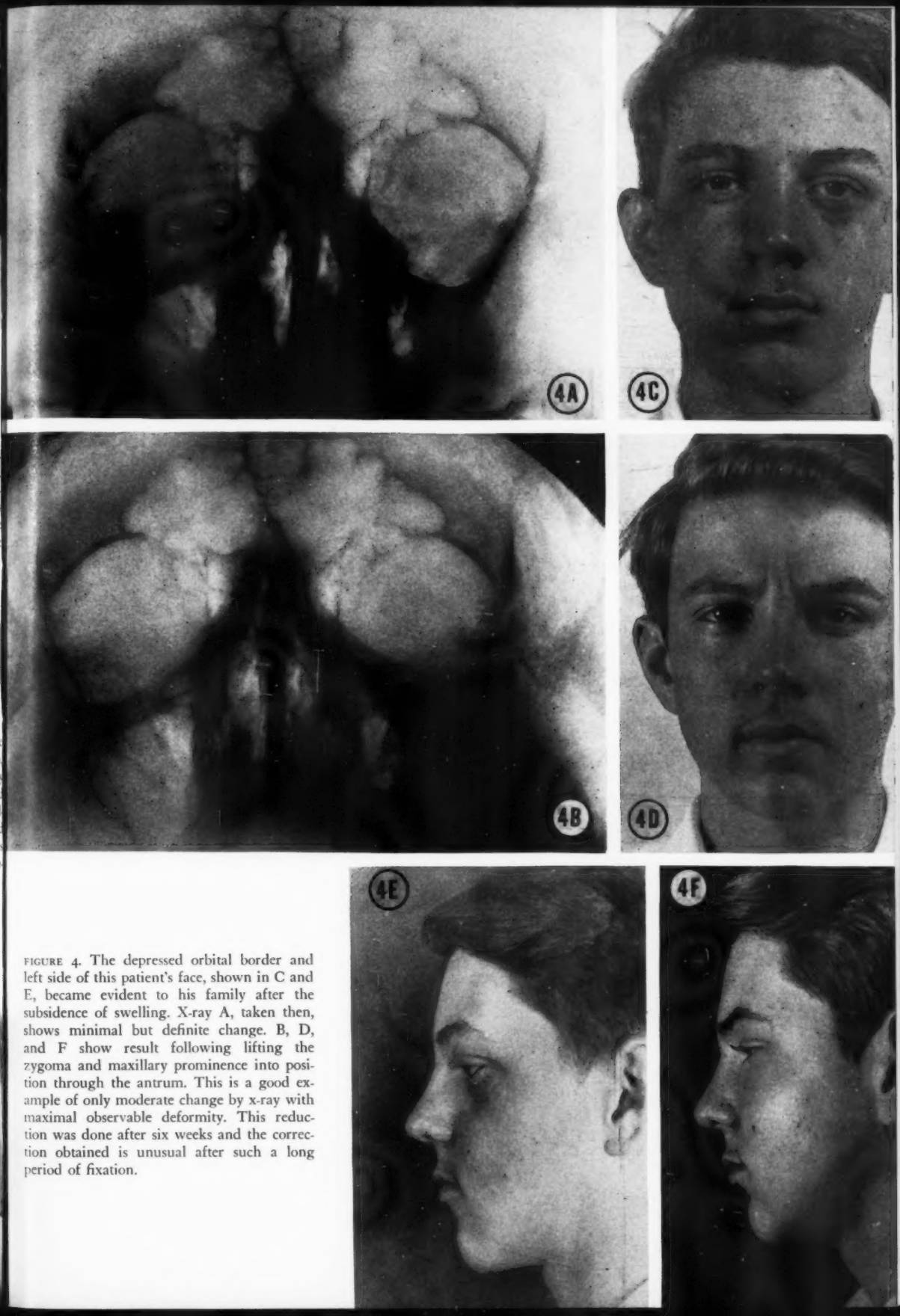


FIGURE 4. The depressed orbital border and left side of this patient's face, shown in C and E, became evident to his family after the subsidence of swelling. X-ray A, taken then, shows minimal but definite change. B, D, and F show result following lifting the zygoma and maxillary prominence into position through the antrum. This is a good example of only moderate change by x-ray with maximal observable deformity. This reduction was done after six weeks and the correction obtained is unusual after such a long period of fixation.

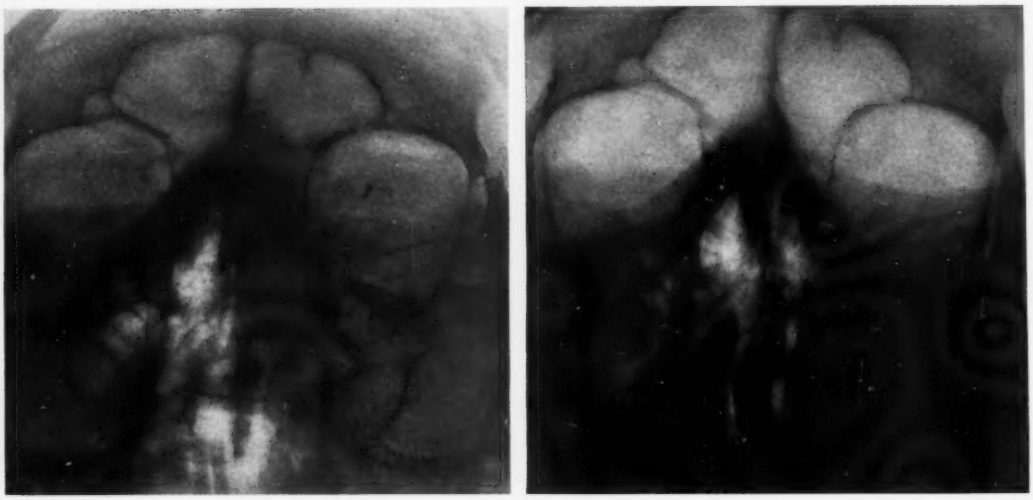


FIGURE 5. Marked downward, outward, and backward displacement of a fractured zygoma with a crushed antrum are shown in A, *(left)* following a mule kick on the front of the face. Result shown in B *(right)* was done by bimanual reduction through the antrum.

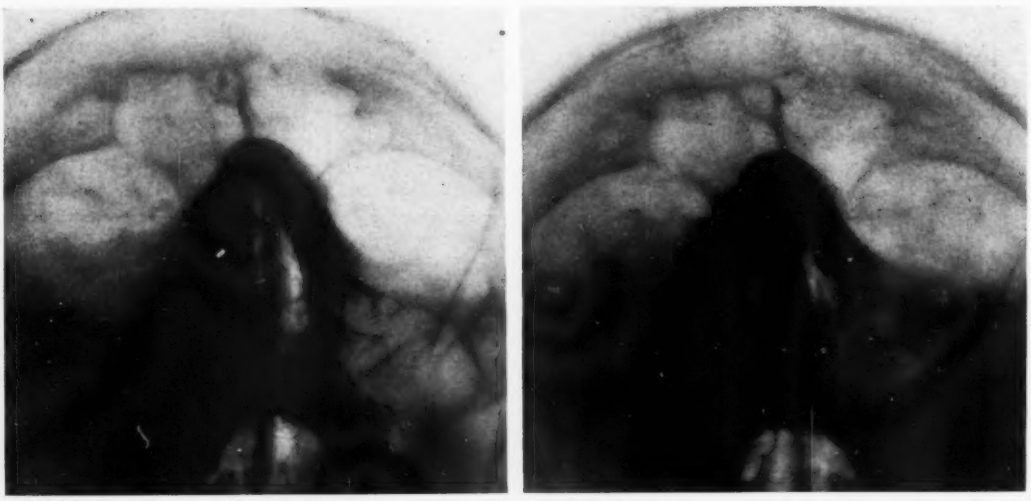


FIGURE 6A. *(left)* Example of slight displacement of the zygoma but extensive comminution of the antral wall and orbital border. B. *(right)* These minute fragments were "mulched" into position directly through the antrum and held with a balsam of Peru iodoform pack. This pack was removed at the end of two weeks and the contour of the region was maintained in normal position and there was complete healing.

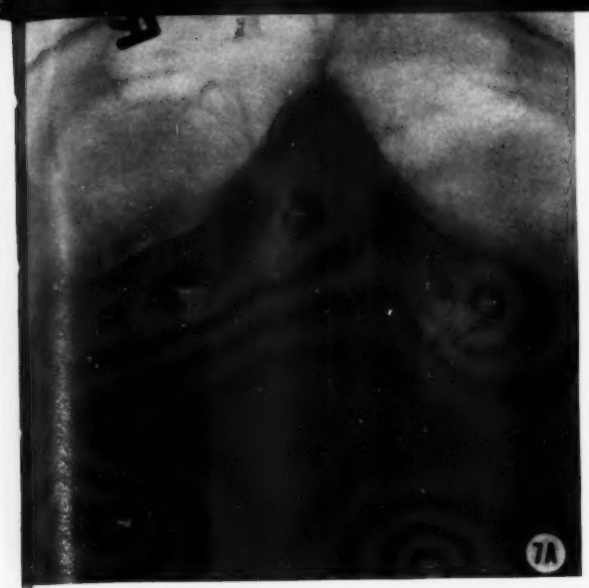


FIGURE 7A. A rather unusual fracture of the arch, but involvi other attachments as well, resulting from a direct blow on t zygoma. It was possible to elevate the displaced bone into positi with a large hook placed under the flange the zygoma. This required only a few se onds to accomplish, with no incision oth than the puncture point of the hook throug the skin. C and D. Appearance sever months following reduction.

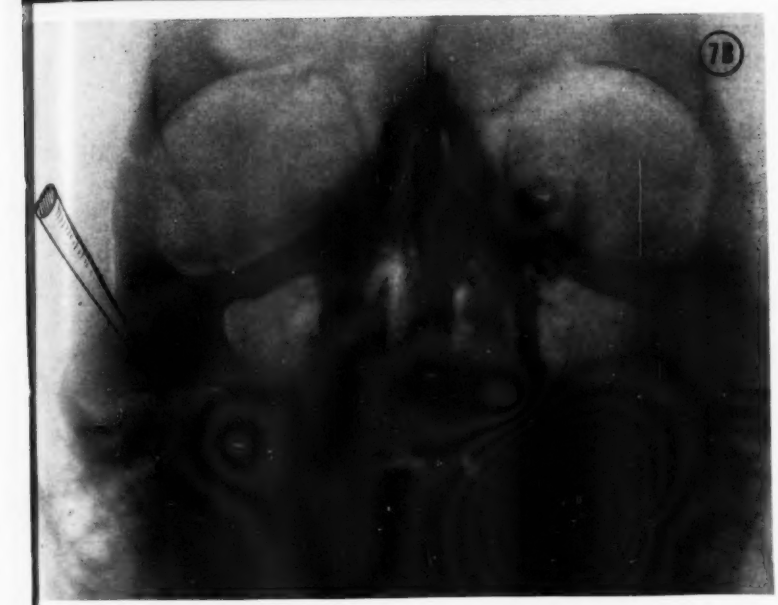
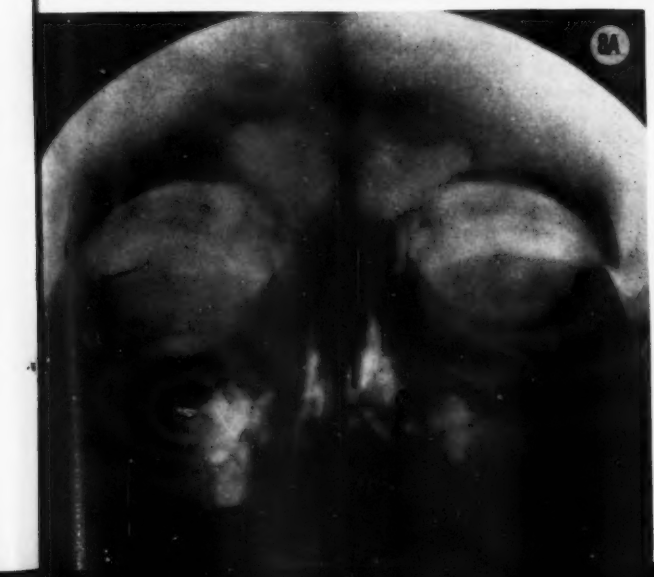
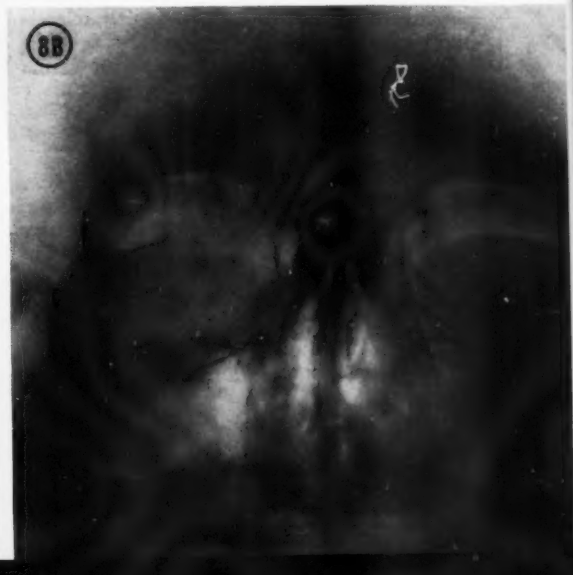


FIGURE 8. Typical position of the zygoma fo lowing a direct blow, the downward, inwar position being more easily felt than seen t x-ray. B. Zygoma lifted out into correct pos tion and comminuted antrum molded in shape. Antral pack still in place, shown t heavy x-ray shadow.





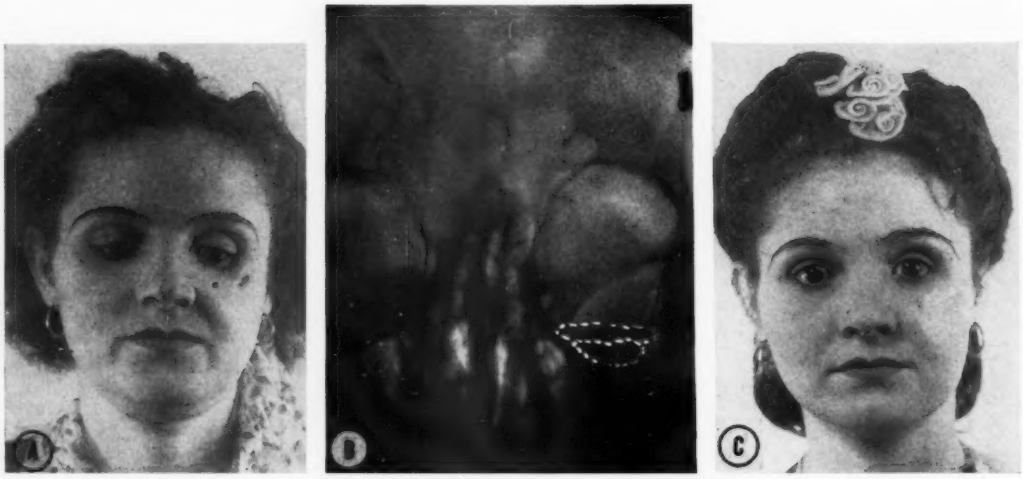


FIGURE 9A and B. Depressed orbital border, flattened malar prominence, and diplopia resulting from automobile accident three months before first seen. No reduction possible at this late date, with fragments firmly fixed out of position. *C.* Result of one operation in which the orbital border and left side of the face were built out and the globe raised almost 1 cm. with preserved cartilage. Implants placed on the zygoma, maxilla, and under the globe on the depressed orbital floor through the old scar were solidly fixed in ten days. Diplopia corrected with elevation of the globe. (Position of cartilage transplants "inked in" in x-ray.)

heavy bone hook through the skin of the face. The point is made to catch under the wing of the zygoma or under the depressed arch and force is exerted to bring the border or the arch up into position. This may be carried out also by elevation from an incision in the temporal area. But it must be remembered that neither of these methods supply any support of the fragments other than their impaction, if they happen to fall into alignment.

As a point of definition, careful differentiation should be made between zygomatic arch fractures and fracture-dislocation of the zygoma as is evident from the above discussion. If the blow is from the front, the zygoma must be displaced from another of its attachments other than the arch, as a solid block can't come away in one place.

Fixation is improved, and swelling minimized by the application of a head dressing of soft, resilient mechanics waste and gauze bandage following reduction.

Postoperative care is mainly concerned with cleanliness and avoidance of infection. The teeth can be cleaned with soapy tooth paste and mouth wash. Penicillin is administered for several days. The patient is allowed out of bed the day after operation and usually may leave the hospital in four or five days.

Union is usually solid enough in about two weeks to remove the pack; even though as shown by x-ray it may be only fibrous, position will be maintained. Antral drainage promptly subsides following removal of the pack and the opening closes spontaneously, provided there is a normal atrium.

SECONDARY RECONSTRUCTION

Although this discussion is primarily concerned with the treatment of fresh injuries, the possibilities of improvement when the fragments are fixed out of position should be mentioned. The flatness of the depressed malar prominence and around the orbit, including the ridge, can be built up to relatively normal contour. Cartilage has to the present proved to be the most satisfactory building material from the standpoint of availability, ease with which it can be shaped at the time of operation, and tissue tolerance. Fresh or preserved autogenous or homogenous cartilage can be used. The depressed orbit can be raised, with this same material placed on the orbital floor to bring it to normal level, or as high as the superior border will allow the globe to be raised, very successfully. Diplopia can many times be corrected, but no promise is made to the individual patient as to definite success, for sometimes in spite of excellent combination of level, it persists.

These requirements of secondary reconstruction further emphasize the need for prompt primary reduction, to try to avoid more complicated and less effective secondary surgical procedures.

Treatment of Renal Colic

EDGAR BURNS

TULANE UNIVERSITY SCHOOL OF MEDICINE AND OCHSNER CLINIC, NEW ORLEANS

TRUE renal colic indicates acute obstruction to the outflow of urine from the pelvis of the affected kidney. The obstruction may be fleeting and so leave no demonstrable evidence of its presence save the colic. In the majority of instances, however, the cause of such obstruction can be demonstrated.

Renal colic is most frequently associated with calculi although it is by no means pathognomonic of this disease. Any condition which provides a means for producing obstruction is a potential source of colic. Notable among these are tumors of the renal pelvis and ureter, intrapelvic hemorrhage, accumulation of pus, crystalline material, or amorphous detritus. Torsion of the pedicle or kinking of the ureter, as seen in nephroptosis, or sudden change in body position may also produce typical renal colic.

Characteristically, the pain of renal colic occurs without warning as a sudden, severe, tearing pain in the loin. It may last only a few seconds, leaving the patient completely free of discomfort. Conversely, it may last for hours taxing the patient to the limit of his endurance. It may occur as a solitary attack, but more often it is recurrent, varying in its frequency from hours to days or years.

Though it may remain localized, the pain frequently radiates from the renal area, and the course usually taken is anteromedially downward as "along the course of the ureter." The pain may travel downward along the lateral or posterior aspect of the thigh on the affected side, upward toward the scapula of the same side, medially toward the epigastrium or directly to its opposite member (reno-renal reflex). Testicular or labial pain in association with renal colic is usually indicative of obstruction in the lower ureter.

During a severe attack of colic the patient is notably restless. He is usually cold, perspiring, and ashen. He is likely to be found in an attitude of flexion while clutching his flank or abdomen; or he may drape himself over the back of a chair or sofa in order to provide flexion and pressure on the abdomen. He begs for relief at any cost. Nausea to the point of active vomiting may be present. If the obstruction is low in the ureter, the patient may complain of extreme urgency and frequency, or even rectal tenesmus.

Palpation of the involved side usually discloses muscular spasm in association with tenderness of the affected kidney. Only rarely is one able to disclose any palpable enlargement of the affected kidney. Unless the obstruction is accompanied by urinary infection and consequent urosepsis, there is no febrile response or fundamental alteration of the pulse rate other than moderate acceleration of rhythm during the height of the attack.

In the absence of long-standing urinary disease, no significant blood changes occur. The urine is usually altered to some degree. The change may be so slight as to be insignificant, but more often careful examination of the specimen yields important information; for example, the presence of red blood cells, white blood cells, crystalline material, or even bits of tumor tissue. It is mandatory that the specimen obtained from women be a catheterized one.

True renal colic must be differentiated from the more or less constant aching pain and tenderness which also occur as manifestations of renal disease. Colic may precede, supersede, or follow such pain. It is at this junction that diagnostic confusion arises. Because of the intimate interrelationship of the nerve supply to the various abdominal viscera and the kidney and ureters, the abdominal manifestations of genitourinary disease may be protean. In over one-third of patients with urologic disease the manifestations are entirely abdominal. It is interesting to note that 40 per cent of patients with painful anomalies of the genitourinary tract who have come under our observation have had previous laparotomies which were based upon erroneous diagnoses.

The use of intravenous pyelography in establishing the cause of renal colic cannot be urged too strongly. It may be used in the presence of what appears to be an acute abdominal catastrophe and not infrequently will yield evidence to the contrary. The ease and simplicity of its administration, and the information it provides make its use as a routine diagnostic procedure almost mandatory.

The rational treatment of renal colic ultimately necessitates removal or correction of the underlying cause. Treatment of the colic itself demands immediate administration of large and, if needed, repeated doses of morphine. It is well known that morphine increases the tone of the unstriated muscle of the renal pelvis and ureters so that pain may be increased until sedation affects the higher centers. Atropine and hyoscine neutralize this early stimulating effect of morphine and one or the other should be given along with morphine. Inadequate sedation in these patients is inexcusable. Experience with antispasmodics such as deproteinized pancreatic extract and the like have, in our hands, proved so unsuccessful that we no longer use them.

Scientific Exhibit

Pheochromocytoma: Diagnosis and Treatment

MARVIN C. BECKER, M.D., ROSE D. BASS, M.D., AND CHARLES M. ROBBINS, M.D.

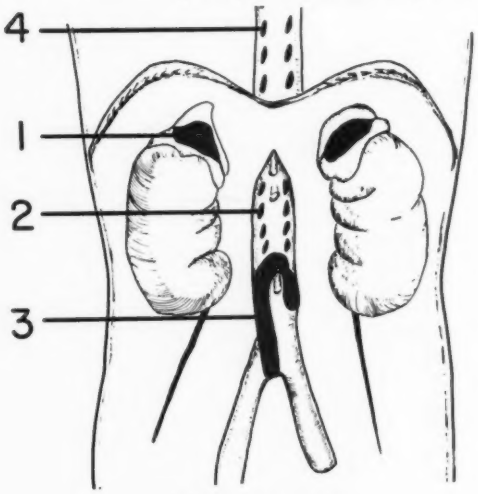
NEWARK BETH ISRAEL HOSPITAL, NEWARK, N. J.

INCIDENCE OF THE TUMOR

THE pheochromocytoma is a tumor formerly diagnosed almost exclusively at autopsy but is now subject to accurate clinical diagnosis, particularly with piperidylmethyl benzodioxane (933F). Hypertension caused by a pheochromocytoma represents the only type that may be considered as curable.

The true incidence of this tumor is not reflected by the small number of cases reported in the literature (about 175 to date). A total of 5 cases was located by routine examination of the adrenals in a series of 1,000 hypertensive patients undergoing sympathectomy (Smithwick, cited by Goldenberg, Snyder and Aranow, *J.A.M.A.* 135:971 [Dec. 13] 1947), indicating that pheochromocytomas may account for about 0.5 per cent of the hypertension in the nation.

The tumor occurs in children as well as in adults of all ages, but it is most common between the ages of 20 and 40. Females are perhaps more commonly affected.



CHROMAFFIN SYSTEM

LOCATION OF THE TUMOR

Epinephrine-producing tumors may occur anywhere in the chromaffin system except the carotid body:

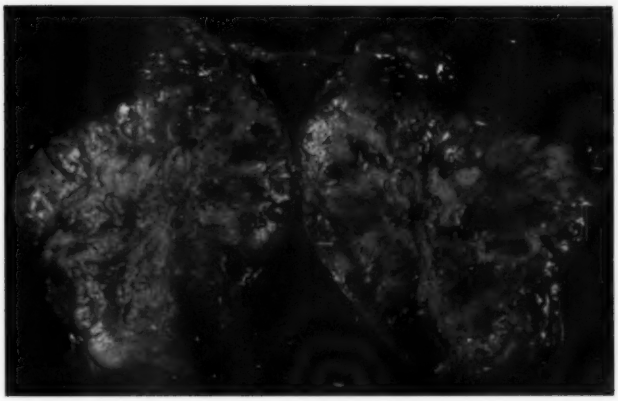
1. Adrenal medulla (10 per cent bilaterally)
2. Abdominal paraganglia
3. Organ of Zuckerkandl
4. Thoracic paraganglia

PATHOLOGY

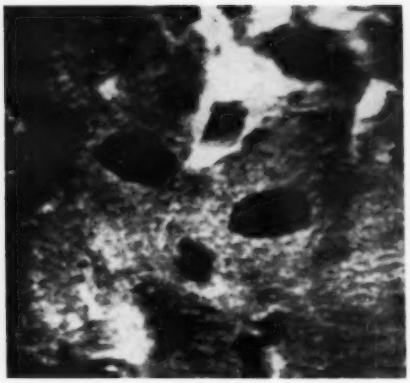
The tumor is usually benign (10 per cent are malignant). The size may vary from 1 to 12 cm. or more in diameter. Multiple tumors are common.

Tumor cells stain with a characteristic affinity for chromic acid, manifested by a brown color with bichromate stains.

Adapted from an exhibit shown at the New Jersey State Medical Convention, Atlantic City, N.J., April, 1949, and the Graduate Fortnight, New York Academy of Medicine, New York, N.Y., October, 1949.



GROSS SPECIMEN



PHOTOMICROGRAPH

CLINICAL PICTURE

Clinical findings may follow one of two patterns:

A. CLASSICAL COURSE:

Intermittent attacks varying in frequency and duration but characterized by *paroxysmal hypertension* associated with:

Pounding headache, sometimes associated with hyperglycemia or glycosuria occurring spontaneously or precipitated by unusual pressure from changes in body position.

Palpitation
Tremor
Hyperhidrosis
Convulsions
Collapse

B. ATYPICAL COURSE:

The pheochromocytoma may frequently be associated with *sustained hypertension* rather than paroxysmal hypertension. Such cases resemble clinically other forms of sustained hypertension.

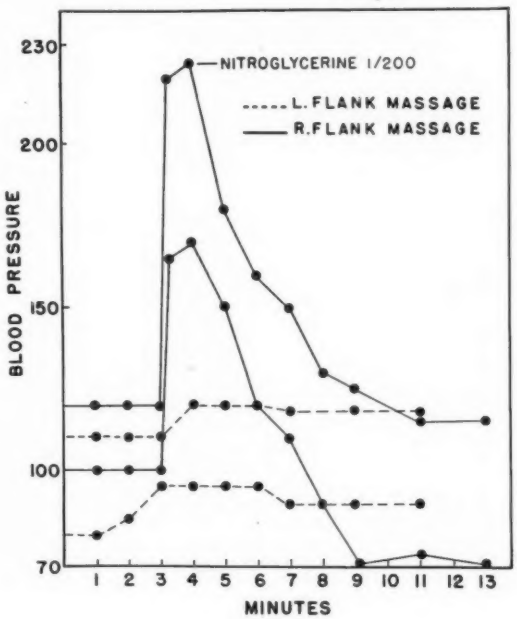
They occur most often:

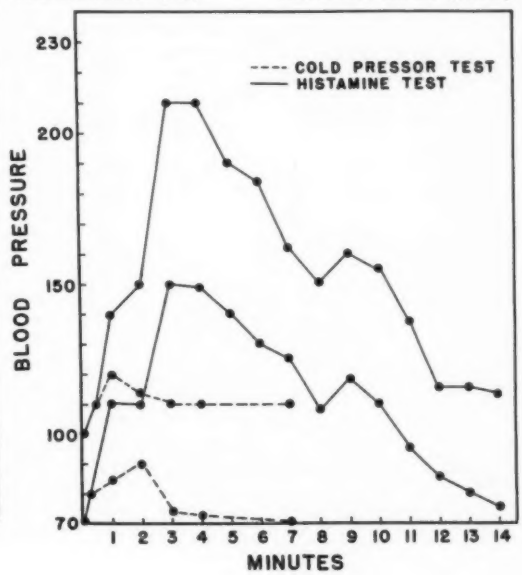
Later in course of undiagnosed cases
In children

They are associated with:

Elevated basal metabolic rate
Characteristic retinal changes (in children)

FLANK MASSAGE *(left)* HISTAMINE CHART *(below)*





DIAGNOSIS

The diagnosis is based upon:

I. High index of suspicion.

II. Reproduction of an attack.

A. Mechanical means: flank massage.

B. Pharmacologic means:

1. Stimulation of epinephrine release, with resultant increase in hypertension, by means of drugs that depress blood pressure in absence of pheochromocytoma:

a. Histamine base (Dose: 0.05 mg. intravenously)

b. Tetra-ethyl ammonium chloride (Dose: 400 mg. intravenously)

c. Mecholyl (Dose: 25 mg. subcutaneously)

III. Termination of an attack by pharmacologic means.

Disadvantages of precipitating a hypertensive crisis characteristic of earlier tests for the pheochromocytoma may be overcome by using one of the benzodioxane derivatives. In the presence of excessive amounts of circulating epinephrine, a brief but dramatic drop in blood pressure results from the injection of the test dose. When hypertension is not associated with a pheochromocytoma, the blood pressure either remains constant or increases moderately.

This drug is of foremost value in patients with sustained hypertension in whom the use of epinephrine-releasing drugs might be dangerous. It provides an effective, simple, harmless means of detecting the pheochromocytoma in the routine study of all sustained hypertensives.

Piperidylmethyl benzodioxane (933F*). Dose: 10 mg. per square meter of body surface intravenously.

IV. The tumor may be localized with the aid of x-rays:

A. Frequently demonstrated without special technic.

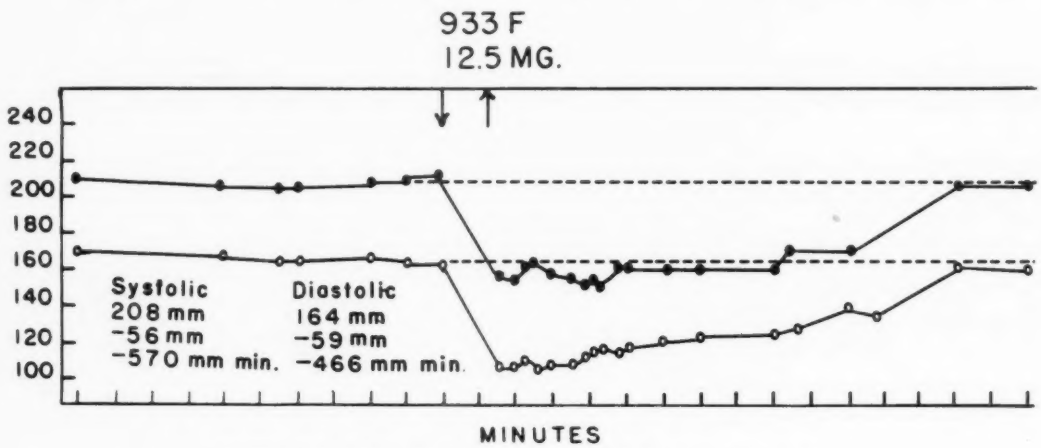
B. Visualized best with perirenal insufflation and laminography.

V. The tumor must be differentiated from all other conditions associated with similar findings. These include:

A. Especially in children:
Nephritis
Coarctation of the aorta

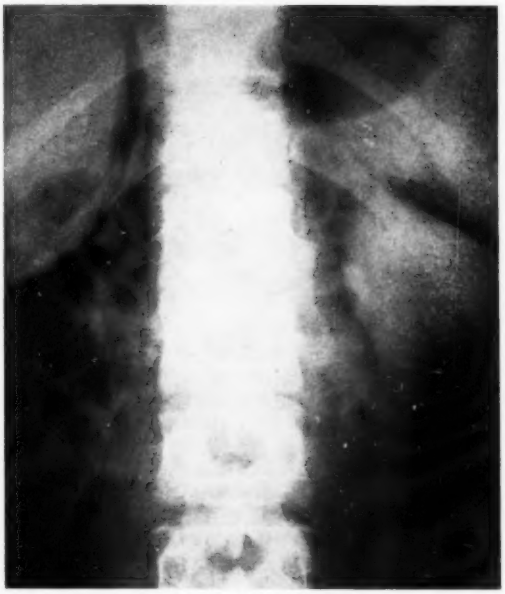
B. Especially in adults:
Malignant hypertension
Glomerulonephritis
Essential hypertension
Diabetes
Hyperthyroidism
Anxiety states
Tabetic crises
Convulsions due to brain tumor, eclampsia, Penfield's tumor, epilepsy

**Supplied by Merck & Company under the name "Benodaine."*

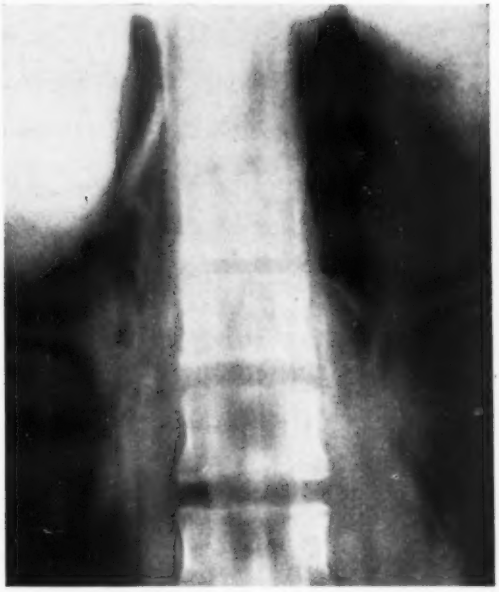


Courtesy of Goldenberg, Snyder and Aranow (J.A.M.A. 135:971, Dec. 1947)

NORMAL ADRENAL GLAND



Perirenal insufflation



Perirenal insufflation and laminography

ADRENAL TUMOR

Perirenal insufflation

Perirenal insufflation and laminography

X-rays courtesy of Seymour F. Wilhelm, M.D.

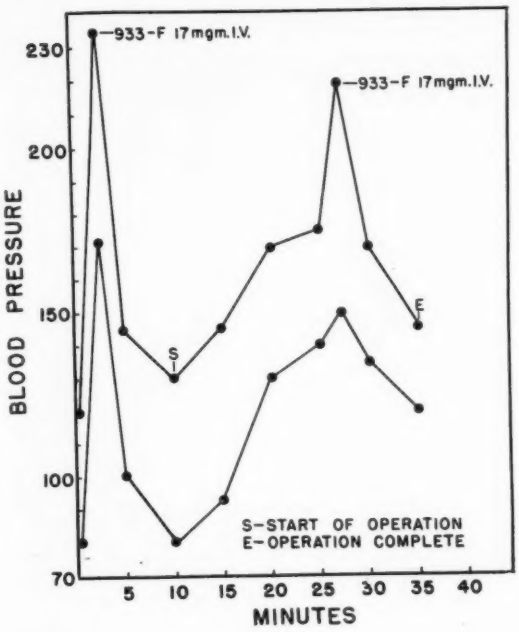
TREATMENT

The treatment of pheochromocytoma is surgical removal.

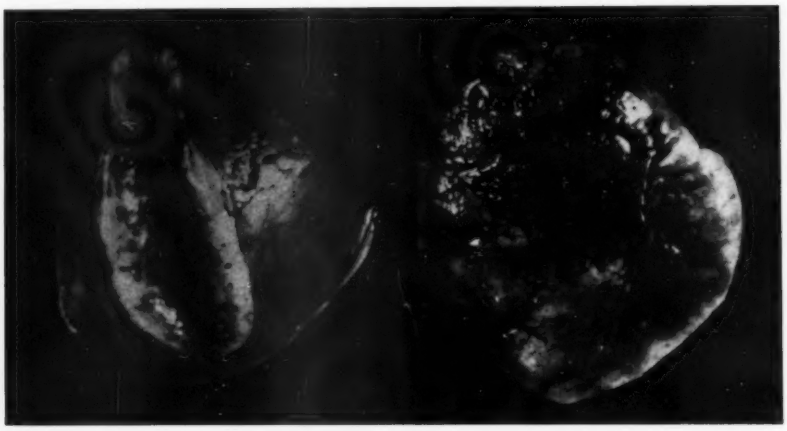
A. Incision:
   1. Flank, if site of tumor has been determined.
   2. Laparotomy, if exploration of chromaffin system is required.

B. Prevention of hypertensive crises during surgery:
   1. Cautious, gentle manipulation of tissues.
   2. Inhalation of amyl nitrite.
   3. Intravenous injection of piperidylmethyl benzodioxane (933F).

C. Prevention of postoperative shock:
   1. Preoperative administration of whole blood, blood plasma, adrenal cortical extract.
   2. General anesthesia (i.e., spinal anesthesia to be avoided).
   3. Postoperative administration of epinephrine-in-oil; synthetic sympathomimetic drugs; adrenal cortical extract.
   4. Constant vigil for 48 hours.



SURGICAL SPECIMEN



ILLUSTRATIVE CASE HISTORY

S. C., 24 yr. gravida II, Para 0, female.

History of severe throbbing headaches last trimester of pregnancy. Warm wet hands, tremors, sweats, enlarged thyroid gland. B.P. 130/74. 5 lb. weight loss. No albuminuria. Normal delivery. 5 days postpartum—sudden, severe throbbing headaches, convulsions. Albuminuria on 2 occasions. Intermittent hypertension, tachycardia.

Confirmative evidence of pheochromocytoma
Benzodioxane test—positive
Histamine test—positive
Right kidney massage—positive
Flat plate and IVP—negative
Surgery: Right flank incision with removal of lemon-sized adrenal tumor. Follow-up: Symptom-free. (Twelve months to date.)

Becker, Bass, Robbins, J. Med. Soc. New Jersey 46:339, 1949.

The Medical Bookman

OPERATIVE TECHNIC IN GENERAL SURGERY*

Although much of the rapid progress in surgery is based upon observations set up on sound surgical principles, a great deal of credit must be given to the development of new concepts and to newer surgical technic. In this book, Dr. Cole has brought together the contributions of 34 outstanding American surgeons, all of whom are well known in the surgical literature for having particular interest in certain phases of surgery.

The publishers have done an excellent job in the illustrating, printing, and binding of the book. It should be mentioned that the publishers have now published a volume on "Operative Technic in Surgical Specialties." The reviewer, however, has found that there are a number of sections in this book which really belong with the Surgical Specialties.

The early section of the text deals with the subjects of wound healing, care of wounds, hemorrhage and shock, management of burns, and preoperative and postoperative care. These chapters contain much that is basic information, knowledge of which is extremely important because the principles discussed are applicable to all types of surgical procedures.

The section on preoperative and postoperative care emphasizes again the need for the surgeon to familiarize himself with the subject of electrolyte needs, needs for carbohydrates, fats, proteins, and vitamins. The need is stressed for a planned program of movement in both pre- and postoperative periods. Methods of supplying caloric and electrolyte requirements are covered in detail. Management of postoperative problems such as pain, nausea and vomiting, distention, insomnia, urinary difficulties, obstipation, pulmonary complications, thrombosis, shock and hemorrhage, fever, wound complications, and nutritional problems warrants careful scrutiny by the surgeon.

Ninety-seven pages are devoted to the topic of amputations. In addition to the usual indications for amputation, the author, Dr. Francis M. McKeever, cites instances where amputations are done to improve function. Such may be the case where a crippled or deformed limb becomes more of a hindrance than an artificial extremity would be, especially in the lower extremity. Emphasis is made that decisions to operate should not be made in infancy or childhood in cases of deformities because estimates of the improvement associated with growth and possibilities for reconstruction cannot be made at an early age.

McKeever stresses the fact that amputation operations require the surgical treatment of all tissues—namely, the skin, fascia, muscles, nerves, bone, and blood vessels. In carrying out surgical procedures, the purpose of the procedure and end result are constantly kept in mind.

There is considerable detail on the use of prostheses and education in their use. This section contains much which is valuable in the problem of restorative procedures for the extremities.

In the section on surgery of the face, mouth, and jaws are included discussions on facial injuries, facial paralysis, tumors of the face, repair of cleft lips and palates, treatment of new growths in the oral cavity, and osteomyelitis of the jaw. This section contains much which the reviewer felt belonged in the field of special surgery.

Management of neck lesions is excellently discussed, with submaxillary tumors, thyroglossal duct cysts, cervical fistulas, bronchial cleft cysts, and hygromas all included. The indications for complete neck dissection are also listed. The author feels that neck dissection is practically the only curative measure for patients with metastatic carcinoma of the cervical lymph nodes and should be employed when the local lesion is controlled or is probably controllable.

In the chapter devoted to the esophagus, the anatomy and topography of this structure are emphasized because of its proximity to the trachea, bronchus, aorta, and pericardium, all of which may be involved in lesions of the esophagus.

Injuries of the esophagus are unusual in that the resulting clinical picture is usually severe. Adequate mediastinal drainage and antibiotic therapy are emphasized. For injuries of the cervical esophagus and extending to the arch of the aorta, the anterior surgical approach is recommended. Posterior thoracic approach is recommended for lesions beneath the arch of the aorta.

The author fails to mention anything about spontaneous perforations of the esophagus.

*Operative Technic in General Surgery. Written by 34 American surgeons and edited by Warren H. Cole, M.D., F.A.C.S. 951 pages, illustrated. 1949, Appleton-Century-Crofts, Inc., New York. $16.00.

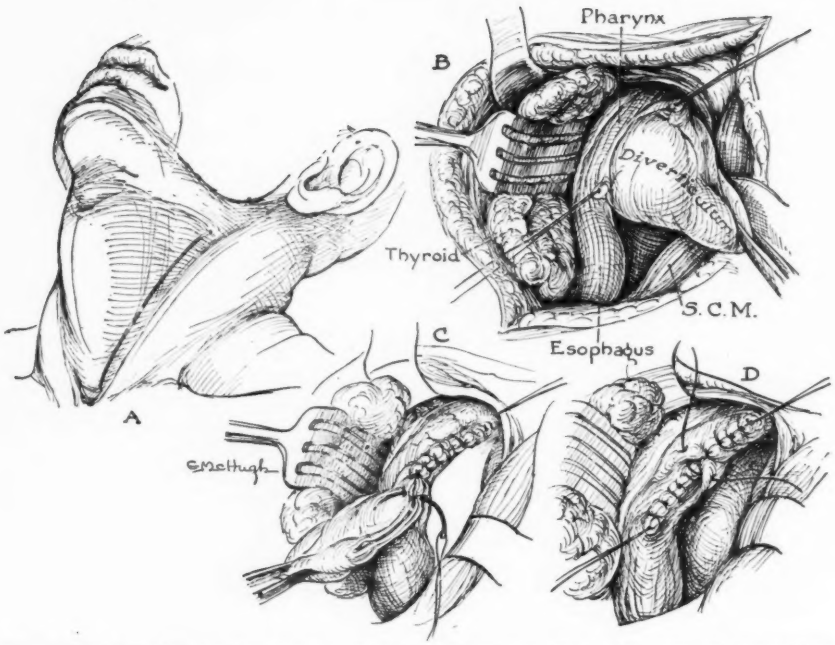


FIGURE 156b. Drawing showing location of incision and exposure for mobilization of diverticulum. In this instance the neck of the sac was wide and closure following the resection was made by interrupted sutures as illustrated in (c) and (d).

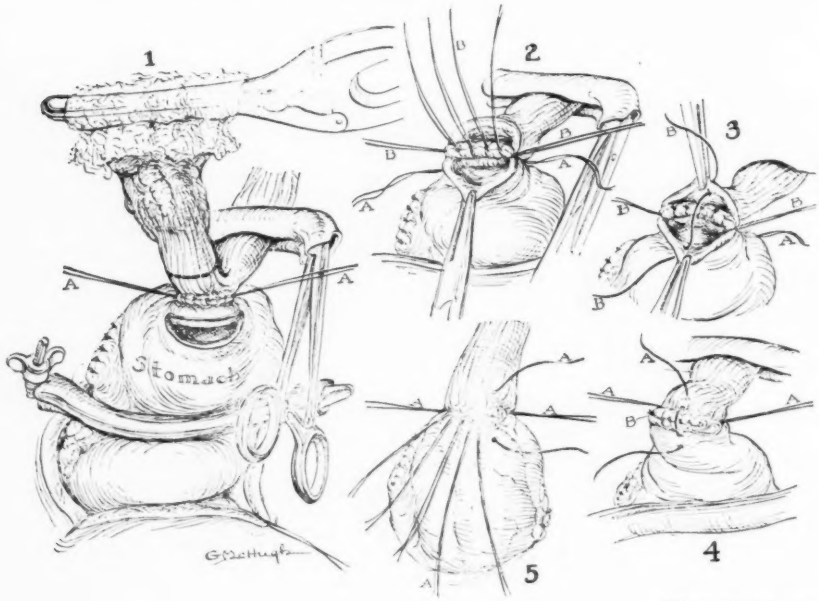


FIGURE 160c. Technic for anastomosing the esophagus and fundus of the stomach by suture.

(Illustrations from: Cole, "Operative Technic")

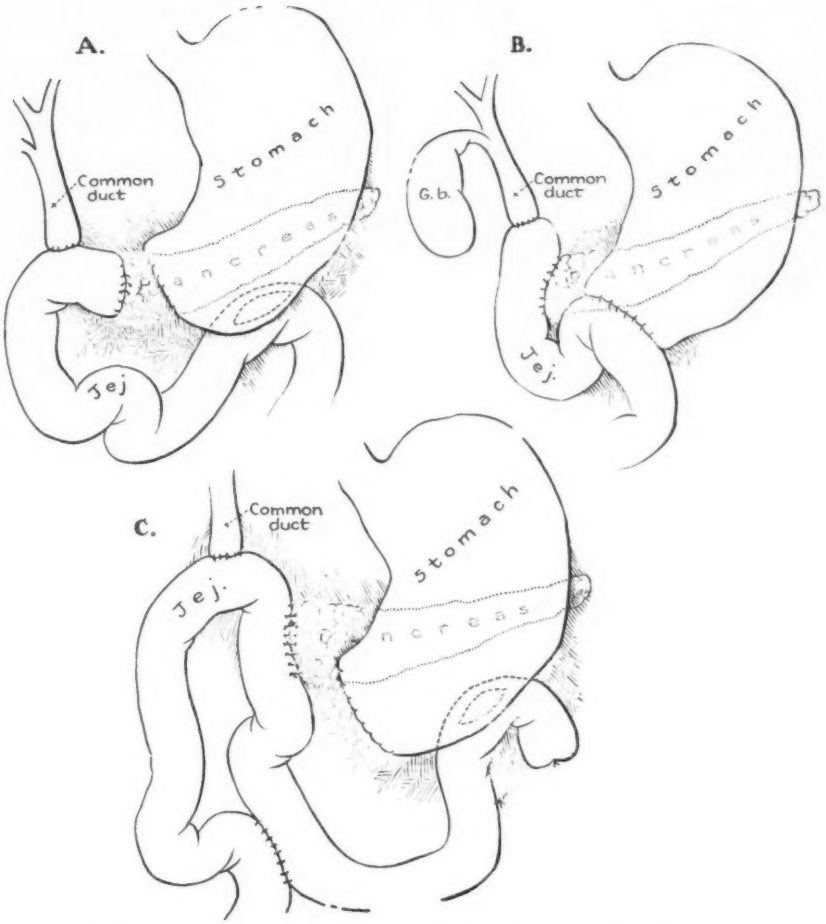


FIGURE 260. Showing various methods of reconstituting the upper alimentary tract after pancreatoduodenectomy with implantation of the pancreatic stump into a loop of jejunum. (A) The transected end of jejunum is brought up for implantation of the common bile duct and stump of pancreas, followed by anastomosis of the jejunum to stomach; (B) Essentially similar procedure to the above with higher gastro-jejunostomy; (C) Implantation of common bile duct and pancreas into long loop of jejunum.

Treatment of diverticula of the esophagus has been divided between one-stage versus two-stage procedures. Dr. W. E. Adams, who prepared this section, states that the risk of mediastinal infections following one-stage procedure is probably no greater than the two-stage procedure. This undoubtedly has been brought about by the use of antibiotic and chemotherapeutic procedures. In the section on benign obstructions of the esophagus, one of the important causes is said to be swallowing of caustic soda. According to Adams, such obstructions can be managed satisfactorily by dilatation. He fails to mention whether the patient who has swallowed caustic material should be intubated at once or when and how frequently dilatations should be done. These points are of importance since there is controversy regarding this aspect.

According to the author, 90 per cent of carcinomas of the esophagus are located in the middle or lower third of the esophagus. The transthoracic approach is usually employed in the majority of the cases. Lesions

of the cervical esophagus and middle third of the esophagus and gastro-esophageal junction are discussed separately and in detail. In most instances, an attempt is made to resect the lesion and to make primary anastomoses with the distal and proximal structures.

The topic of abdominal incisions and methods of closure is handled in considerable detail by Drs. Frederick A. Coller and Kenneth F. Maclean and includes a thorough review of the anatomy and physiology of the abdominal wall as well as a history of abdominal incisions and descriptions of making such incisions. Equal detail and deliberation are given the subject of closure of the abdominal wall. The problem of herniation following surgery is also included, with mention of the role of anatomic and physiologic factors in the production of herniation. Vertical types of incisions are not considered physiologic since they run across the major aponeurotic fibers of the abdominal wall. In addition, they tend to denervate that portion of the abdominal wall. Coughing and vomiting are blamed as the causes of the vast majority of wound disruptions. Numerous workers are quoted who have found in large series that transverse incisions have fewer instances of wound disruptions.

This chapter is one of the best written and illustrated in the entire book and deserves careful scrutiny by all surgeons who have occasion to enter the abdominal cavity.

The chapter on surgery of the stomach, duodenum, and vagotomy (in treatment of peptic ulcers) includes the management of polyps, diverticula, tuberculosis, syphilis, and peptic ulcer. It is emphasized that lesions in the stomach, although malignant in nature, may respond to medical treatment. Thus, lesions which have been healed under medical management should be examined at intervals of three months for one year regardless of whether symptoms are present or not.

The author, Dr. Waltman Walters, generally feels that partial gastrectomy, particularly for large gastric ulcers with a Billroth I, or Polya, or Polya-Balfour type of anastomosis is a preferable procedure provided it can be done with a mortality rate below 2 per cent. Reasons for this type of surgery are that prompt relief of symptoms follows, there is total absence of any recurring ulcerations, and partial gastrectomy is a preferable procedure should the lesion prove to be a malignant one.

For duodenal ulcers, Walters rates gastroenterostomy or partial gastrectomy as preferable to pyloroplasty. He states that those who advocate partial gastrectomies only for duodenal ulcer do so on the basis of presence of associated gastritis and low incidence of recurring ulcers. It is pointed out, however, that even with surgeons of considerable experience, mortality will vary from 2 to 5 per cent. The belief is stated that the only object partial gastrectomy accomplishes for duodenal ulcer better than gastroenterostomy is to produce a greater reduction of gastric acidity and gastric secretion in a greater number of cases with fewer recurring ulcerations.

Indications and technic for total gastrectomy are outlined. Walters writes that in a certain number of instances, even when the radiologist reports a lesion to be of borderline operability or inoperable, about 15 to 20 per cent of these will still have sufficient stomach above the lesion so that removal of lesion may be accomplished. Thus, the author recommends that all malignant lesions have explorations regardless of the extent of the lesion, provided there are no evidences of distant metastases.

A few pages are devoted to the topic of gastric vagotomy in the treatment of peptic ulcer. Dr. Lester R. Dragstedt, who wrote this section, states that numerous other workers have tried vagotomy for the treatment of peptic ulcer and he attributes the poor results obtained by others to the fact that probably they did not accomplish complete vagus section.

The technic for transthoracic and transabdominal vagotomy is described. Postoperative treatment is stressed, especially the first two or three days, because of decrease in tonus of stomach. Dragstedt recommends decompression of the stomach during this period. To date, he has had 490 patients and has had favorable results. Emphasis is placed on the fact that the problem of differential diagnosis with cancer complicates the picture somewhat; thus in questionable lesions he does not hesitate to do a subtotal gastric resection. If a vagotomy is done and the ulcer does not heal in three to six weeks, a gastric resection is recommended.

Dr. Clarence Dennis describes the technic of the single barreled ileostomy construction which he has found successful, but the reviewer felt he should have included some alternate procedures, such as open anastomoses and exteriorization procedures for treatment of intussusception, inasmuch as these technics are probably of greater general use at the present time.

The section on treatment of colon (Drs. Roscoe R. Graham and Jesse Gray) and low rectal lesions (Claude F. Dixon and A. Lee Lichtman) is introduced with statements of basic principles governing surgical technic. The authors believe that given a series of left colon carcinomata, the percentage of resectable lesions will be greater when a defunctioning colostomy is used. They are aware that a number of clinics are doing resection of the colon without preliminary colostomy. In the authors' opinion, inasmuch as a colostomy is devoid of any operative mortality, the only criticism which can be leveled at this type of operative procedure is that multiple stage operations

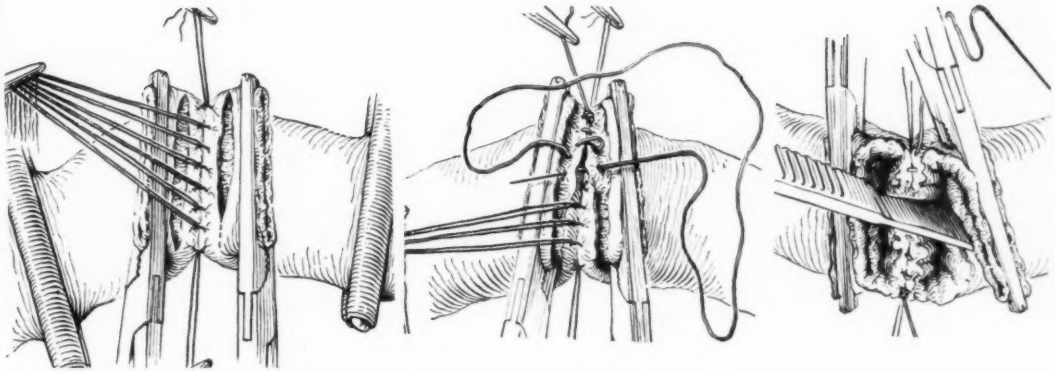


FIGURE 304 (A). Open end-to-end anastomosis. Interrupted stitches are silk.

1. *(left)* Stay sutures inserted and held tightly at each end of proposed suture line. Interrupted sutures unite serosa to serosa. Seromuscular coat incised to mucous membrane. 2. *(center)* Second row continuous catgut oversews seromuscular flap. Stay sutures make accurate approximation easy and are cut as catgut suture reaches them. 3. *(right)* Lumen opened on both sides, showing on one side tissue crushed by forcep being cut away. This is done also on the opposite side.

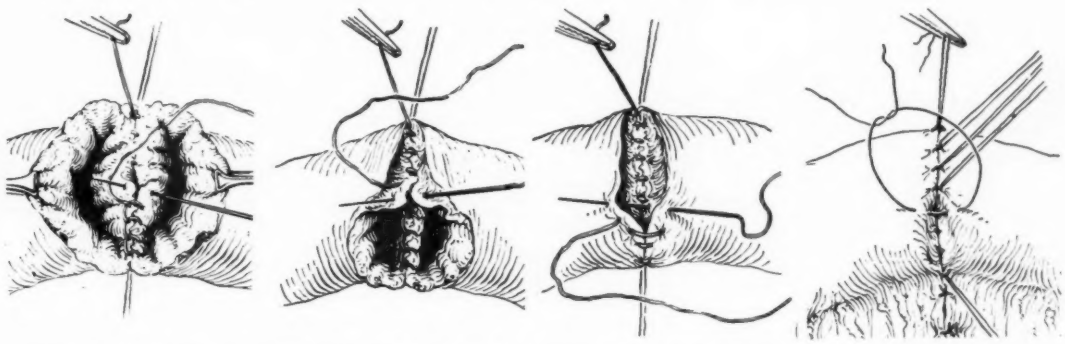


FIGURE 304 (B). Open end-to-end anastomosis completed. Mesentery closed and anastomosis completed anteriorly by interrupted silk sutures.

4. *(left)* Posterior layer mucous membrane is united to mucous membrane with blanket stitch while lumen is held open with Allis forceps.

5. *(right)* Posterior mucous membrane to mucous membrane suture is continued anteriorly, uniting mucosa to mucosa.

6. *(left)* Continuing with the same suture, the anterior seromuscular layers are united.

7. *(right)* Third anterior layer of interrupted sutures unites serous to serous coats completing the anastomosis. The defect in the mesentery is closed with interrupted sutures.

(From Graham, Roscoe R., in "Surgical Treatment of the Abdomen," Lippincott.

prolong hospital stay, but this is considered justifiable.

There is considerable variance of opinion in the present literature regarding open and closed anastomoses of the colon. The authors feel that there may be less contamination of the field during operation with the closed resection, but this method does not permit accurate mucosa to mucosa suture as is possible with open technic. They firmly believe that a patient rarely dies of a peritonitis caused by contamination at the time of surgery, but rather from a continuous leak resulting from an imperfect anastomosis. The commonest cause for an anastomotic leak is a defect in blood supply of the margins united, and they believe that the bleeding from cut margins which can be seen only with the open technic is surest evidence of viability of segments anastomosed.

For successful repair of abdominal hernia, Drs. Edwin P. Lehman and Charles E. Davis, Jr., emphasize that sound surgical technic is the sine qua non. In the presence of a single proved inguinal hernia for which operation is being done, the decision as to whether to operate on the opposite side presents its own problems. Operation limited to one side is occasionally followed by a hernia on the opposite side. The authors believe that surgical repair of the opposite side is indicated on the slightest evidence of poor structures.

In infancy, there is no need to delay surgery after a diagnosis is made but it is pointed out that frequently obliteration of the hernia sac may occur after birth.

A separate section deals with acute vascular injuries, methods of anastomosis, including treatment of aneurysms and arteriovenous fistulas. Some of the methods for treatment of arteriovenous fistula included in this chapter are quadruple ligation and division, repair of arterial defect after removal of a portion of vein, transverse closure, repair of both artery and vein, and by mass ligation.

The last part of the text presents detailed discussions of the problem of infections, burns and injuries following freezing of the hands, contractures, and diseases of subcutaneous tissues which are amenable to surgical treatment.

Other portions of the book present detailed discussions of such subjects as the pancreas and adrenal, gallbladder and bile ducts, liver and subphrenic space, lymphatic system, spleen and portal hypertension, the breast, thyroid and parathyroid glands, muscles, fasciae, tendons, and bursae.

This text is very easy to read, and without monotony in the method of presentation because different authors have presented each major subject. Because of this, there are at times duplications in certain phases, but this seems to serve more as an emphasis. The beginner in surgery and the student should be cautioned that certain procedures covered in this text may not be considered standard methods; some of the material offered represents aspects which are new and represent original work done by the contributing author. This, of course, does not detract from the value of the book, since these are some of the advances in surgery which have not yet found their way into other texts.

Y. S.

Books received will be acknowledged in this department each month. As space permits, books of principal interest to our readers will be reviewed more extensively.

The Diagnosis of Pancreatic Disease. By Louis Bauman, M.D., Formerly Assistant Professor of Clinical Medicine, Columbia University, and Assistant Visiting Physician to the Presbyterian Hospital, New York. With a Foreword by Allen O. Whipple, M.D. 74 pages. 1949, J. B. Lippincott Company, Philadelphia. $5.00.

Operations of General Surgery. By Thomas G. Orr, M.D., Professor of Surgery, University of Kansas School of Medicine, Kansas City. Ed. 2. 890 pages, with 1700 step-by-step illustrations on 721 figures. 1949, W. B. Saunders Company, Philadelphia & London. $13.50.

Fundamentals of Otolaryngology; A Textbook of Ear, Nose and Throat Diseases. By Lawrence R. Boies, M.D., Clinical Professor of Otolaryngology, Director of Division of Otolaryngology, University of Minnesota Medical School, and Associates. 443 pages with 184 figures. 1949, W. B. Saunders Company, Philadelphia & London. $6.50.

Clinical Biochemistry. By Abraham Cantarow, M.D., Professor of Biochemistry, Jefferson Medical College; and Max Trumper, Ph.D., Commander, H(S), USNR, Lecturer in Clinical Biochemistry and Basic Science Coordinator, Naval Medical School National Naval Medical Center, Bethesda, Maryland. Ed. 4. 642 pages with 38 figures. 1949, W. B. Saunders Company, Philadelphia & London. $8.00.

Atlas of Obstetric Technic. By Paul Titus, M.D., Obstetrician-Gynecologist to the St. Margaret Memorial Hospital, Pittsburgh; Secretary, American Board of Obstetrics and Gynecology. Ed. 2. 197 pages. Illustrations by E. M. Shackleford. 1949, The C. V. Mosby Company, St. Louis. $7.50.

The Physician's Business; Practical and Economic Aspects of Medicine. By George D. Wolf, M.D., Assistant Clinical Professor of Otolaryngology, New York Medical College; Fellow, New York Academy of Medicine. Ed. 3. 563 pages, 96 illustrations. 1949, J. B. Lippincott Company, Philadelphia, London & Montreal. $10.00.

Nursing in Clinical Medicine. By Julius Jensen, Ph.D. (in Medicine), M.R.C.S. (Eng.), L.R.C.P. (Lond.), Assistant Professor of Medicine, Washington University, St. Louis; Member of Staff, St. Luke's Hospital, St. Louis; and Deborah Maclurg Jensen, M.A., B.Sc., R.N., Lecturer in Nursing Education, Washington University, St. Louis; Visiting Instructor at St. Louis City and St. Luke's Hospitals, St. Louis. Ed. 3. 791 pages, illustrated. 1949, The Macmillan Company, New York. $4.00.

Operative Technic in Specialty Surgery. By Warren H. Cole, M.D., F.A.C.S., Professor and Head of the Department of Surgery, University of Illinois College of Medicine; Director of Surgical Service, Illinois Research and Educational Hospitals, Chicago. Introduction by Allen O. Whipple, M.D., F.A.C.S. 725 pages, with 394 figures. 1949, Appleton-Century-Crofts, Inc., New York. $14.00.

Clinical Interpretation of Laboratory Tests. By Raymond H. Goodale, M.D., Pathologist at the Worcester City Hospital, Worcester Hahnemann Hospital, Belmont Hospital, and Fairlawn Hospital, Worcester, Mass.; Clinton Hospital, Clinton, Mass.; Harrington Memorial Hospital, Southbridge, Mass.; Consulting Pathologist, Veterans Administration Hospital, Rutland Heights, Mass. 605 pages, with 107 illustrations, 3 in color. 1949, F. A. Davis Company, Philadelphia. $6.50.

Physiology in Health and Disease. By Carl J. Wiggers, M.D., D.Sc., F.A.C.P., Professor of Physiology and Director of Physiology Department, School of Medicine of Western Reserve University, Cleveland, Ohio. Ed. 5, thoroughly revised. 1242 pages, illustrated with 280 engravings. 1949, Lea & Febiger, Philadelphia. $10.00.

Pollen-Slide Studies. By Grafton Tyler Brown, M.D., F.A.C.P., Instructor in Clinical Medicine, Georgetown University School of Medicine; Consultant on Allergy, United States Public Health Service; Head, Division on Allergy, Doctors Hospital, Washington, D.C. With a foreword by Wallace M. Yater, M.D., M.S. (In Medicine), F.A.C.P. 122 pages, illustrated. 1949, Charles C Thomas, Springfield, Illinois. $6.00.

The Red Cross Nurse in Action: 1882-1948. By Portia B. Kernodle. 524 pages, illustrated. 1949, Harper & Brothers, New York. $5.00.

The Physiology of Normal Menstruation

ADAPTED FROM A FILM OF THE SAME NAME

Presented to the Medical Profession by

SCHERING CORPORATION · BLOOMFIELD, NEW JERSEY

Script by SOMERS H. STURGIS, M.D.,
Massachusetts General Hospital, Boston,
and JOHN ROCK, M.D., Free Hospital for
Women, Brookline, Mass.

THIS PRESENTATION OF A PHYSIOLOGIC CYCLE HAS BEEN PREPARED TO SERVE BOTH AS AN INTRODUCTION TO, AND AS A REVIEW OF THE CURRENTLY HELD THEORIES ON MENSTRUATION.

THE PHYSIOLOGY OF NORMAL MENSTRUATION

Extensive observation has shown that menstruation varies in incidence with different individuals, but generally recurs in cycles of from 26 to 30 days. For didactic purposes we shall assume arbitrarily that a typical cycle lasts an average of 28 days.

The cycle of menstruation involves three organs: the anterior pituitary gland, the ovary, and the uterus.

The anterior pituitary probably secretes at least three gonadotropic hormones, which induce the sex glands to produce their own particular hormones. The three known gonadotropic hormones are: follicle-stimulating hormone, or "FSH," luteinizing hormone, "LH," and the luteotropic hormone. In the ovary two steroid hormones have been identified: an estrogen, alpha-estradiol, and progesterone.

Each month, in response to these hormones, the endometrium undergoes marked changes which eventually result in distintegration with bleeding. The onset of hemorrhage marks the beginning of each cycle.

Normal cyclic bleeding results from interactions in correct sequence of all five hormones mentioned. From before birth to puberty, the follicles of the ovary develop to the stage of antrum formation, and may even produce some estrogen, but we do not know what initiates puberty. Possibly at the menarche the pituitary produces an increased amount of FSH, which causes growth of the follicles, and also of LH, which provokes ovulation.

On the other hand, it may be that a follicle first "attains competence" at puberty to respond fully to the same amount of FSH it has been previously receiving, and only when mature does it become susceptible to the action of LH, which induces it to rupture.

In either case, the ovum is discharged, and finds its way into the fallopian tube. A corpus luteum forms in the ruptured follicle. The luteal hormone, progesterone, is secreted, and all other large follicles regress.

If the ovum is not fertilized, menstrual bleeding follows in approximately two weeks. Constant recurrence of such a sequence gives the characteristic cyclic pattern to the physiology of uterus, ovary, and pituitary.

It is customary to designate the first day of menses as "Day One" of the cycle. On day 1, FSH is often present in sufficient amounts to be detectable in the urine. FSH causes growth of the new crop of follicles, and a gradual rise in the level of estrogens results from this growth.

The follicles show a consistent growth curve and increased hormone secretion through day 12. The rise in estrogen is associated with two important changes in pituitary output: (1) FSH decreases in the urine, and (2) LH output is apparently augmented.

Thus, with the great increase in estrogen production in the first twelve days, the effective ratio of FSH to LH on day 13 is the reverse of what it was on day 1.

By day 13 one follicle becomes ascendant, and is found bulging on the surface, where the cortex is already thinned. Under high power one can see that the granulosal cells, especially those of the cumulus, are widely separated.

On day 14, principally due to the action of LH, ovulation occurs through a break in the thinned ovarian cortex. The ovum, surrounded by some of the cells of the cumulus, is expelled into the peritoneal fluid with the liquor folliculi. The lining of the follicle is rapidly converted into luteal tissue, forming the corpus luteum. This takes place only in the presence of LH. However, it has been demonstrated that luteotropin from the anterior pituitary must also be present for the corpus luteum to produce its specific hormone, progesterone.

Corpus luteum function can be detected in most cases by at least forty-eight hours after ovulation, when both estrogen and progesterone are secreted by this organ. When progesterone production is at its height, there is a decrease in LH. All other follicles maturing at this time degenerate in the process known as atresia, and thus no further ovulation will occur in

this particular cycle. By day 20 the estrogen level has usually risen to the height existing before ovulation.

The corpus luteum continues to function until about day 25. By day 26 the excretory product of progesterone, pregnandiol, is rapidly decreasing in the urine in the absence of pregnancy, indicating a degeneration of the corpus luteum. One day later both estrogen and progesterone production are minimal.

Day 28 finds the reactivated pituitary secreting more FSH, which stimulates growth of a new crop of follicles for the next cycle.

The first day of menses occurs approximately forty-eight hours after the growth of the endometrium has ceased. Through two or three succeeding days the upper two-thirds of the mucosa is lost. The resurfacing of the endometrium starts about day 4 of the typical cycle, and bleeding soon stops.

On day 6 in the cycle the glands are simple and tubular, arising from the area close to the myometrium, and extending from there straight to the surface. Under the influence of estrogen growth occurs. The thickness of the endometrium as a whole increases, but the glands grow at a greater relative pace, coiling more and more.

The blood vessels are of two sorts: the straight, basal arterioles, which spread out laterally near the myometrium, and the coiled, spiral arterioles, which supply the superficial two-thirds of the endometrium. The basal arterioles do not change materially as the cycle progresses, but the spiral ones grow at an amazing rate, and become tightly coiled.

On day 14 in this typical cycle ovulation occurs. The earliest sign of action of the luteal hormone, progesterone, on the endometrium is found in the epithelial cells of the glands on day 15 or 16. The nuclei range themselves in an irregular line in the center of the cells, while glycogen-rich secretion collects in an apparent clear space toward their basement membrane, and the cytoplasm is crowded toward the glandular lumen.

In two days the nuclei begin to regress to the base of the cells, as irregular projections of the epithelial lining protrude into the lumen.

The luminal margin bulges with secretory droplets. These droplets escape from the cells and begin to coalesce in the lumen at least by day 19. One day later most of the bubbles of secretion have burst, leaving a frayed margin and low columnar cells. At this time the glands have "saw-toothed" luminal margins as a result of the action of progesterone. The stromal cells, poorly developed, become separated by intercellular edema, which becomes marked by day 21, materially thickening the whole mucous membrane.

By day 22 the progesterone level is at its height. The stromal cells nearest the arterioles then begin to accumulate cytoplasm. Three days later the edema has started to subside, while the stromal cytoplasm accumulates further in the formation of a predecidua.

By day 27 the endometrium has become thinner because of the absorption of the edema. The striking feature of this regression is extreme kinking and coiling of the spiral arterioles, producing circulatory stasis.

As a result of this stasis and anoxemia, superficial areas show the first signs of necroses on day 28, and some extravasation generally occurs under the superficial epithelium.

By the following day the bleeding "lifts off" focal areas of surface epithelium, and thus initiates the menses. By the fourth day of the new menstrual cycle the upper two thirds of the endometrium has been sloughed off. The torn and bleeding surface is repaired from the broken ends of basal glands and arterioles, and by day 6 the endometrium is prepared to go through another cycle of growth.

All parts of this cycle should be considered merely as phases in a continuous process. Individual temporal variations from this outline are the rule rather than the exception, but the basic hormonal pattern is characteristic of the normal woman.

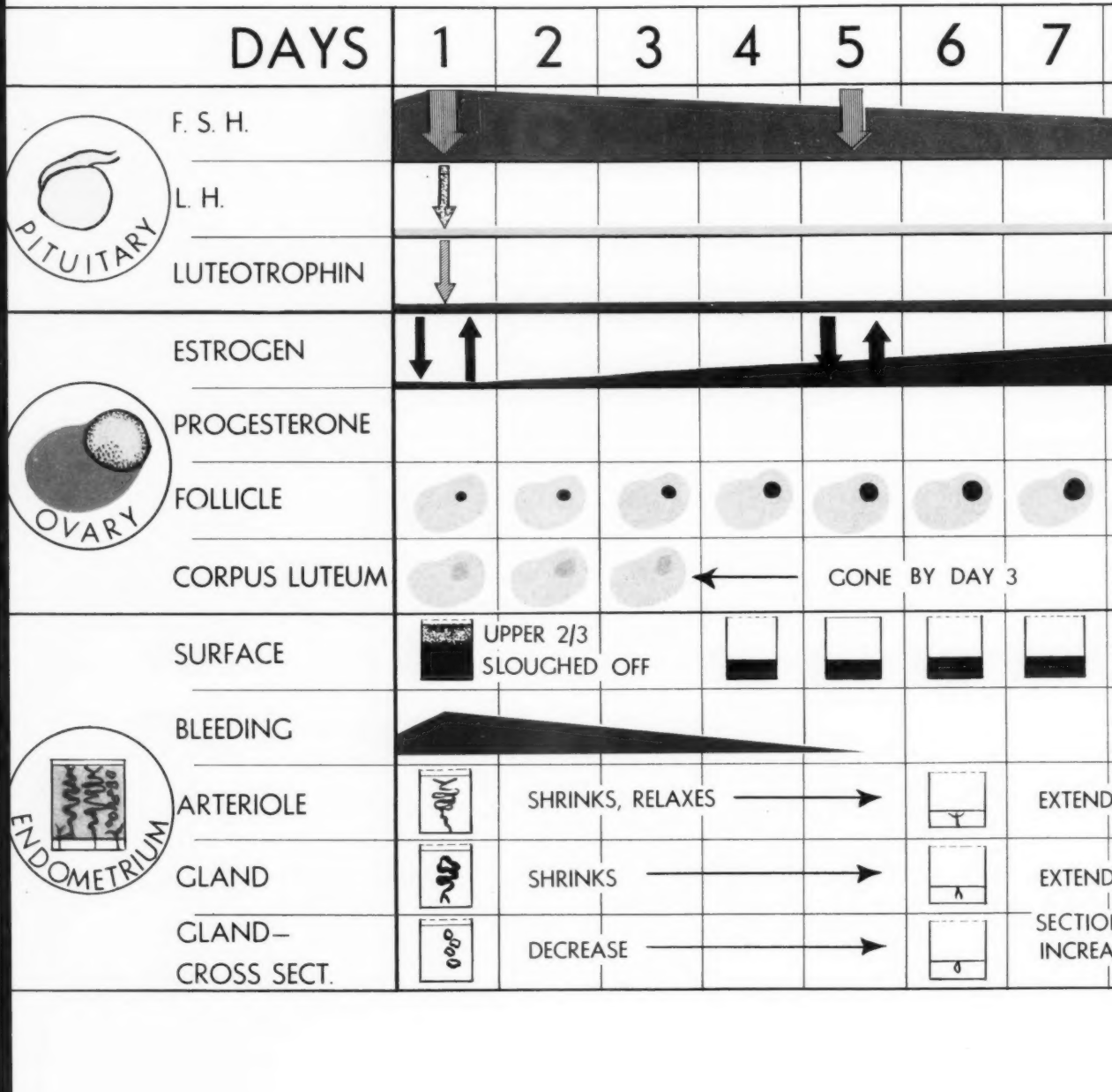
HOW TO OBTAIN THE FILM

To obtain the Schering film, *"The Physiology of Normal Menstruation,"* for presentation before Medical and other professional groups, Medical college classes, and other interested persons, you are cordially invited to write to the Medical Service Department, Schering Corporation, 2 Broad Street, Bloomfield, New Jersey.

When requesting a copy of the film for showing, please be kind enough to supply the following information:

1. What is the name or title of the group before which the film is to be shown?
2. Can you estimate the approximate attendance anticipated?
3. What is the desired *date of presentation?* (Alternate dates should be selected when possible.)
4. What is the name and address of the person to whom the film should be sent and who will assume responsibility for returning the film?
5. Is the copy of the film desired in the *sound or silent* version?
6. Do you wish *also* to present the commercial film presentation on the Chemistry and Pharmacy of the estrogenic hormones?
7. Do you wish to avail yourself gratis of the services of a Schering Professional Service Representative to assist in the presentation and discussion of the film?

MASTER CHART OF HORMONE INTERRELATI



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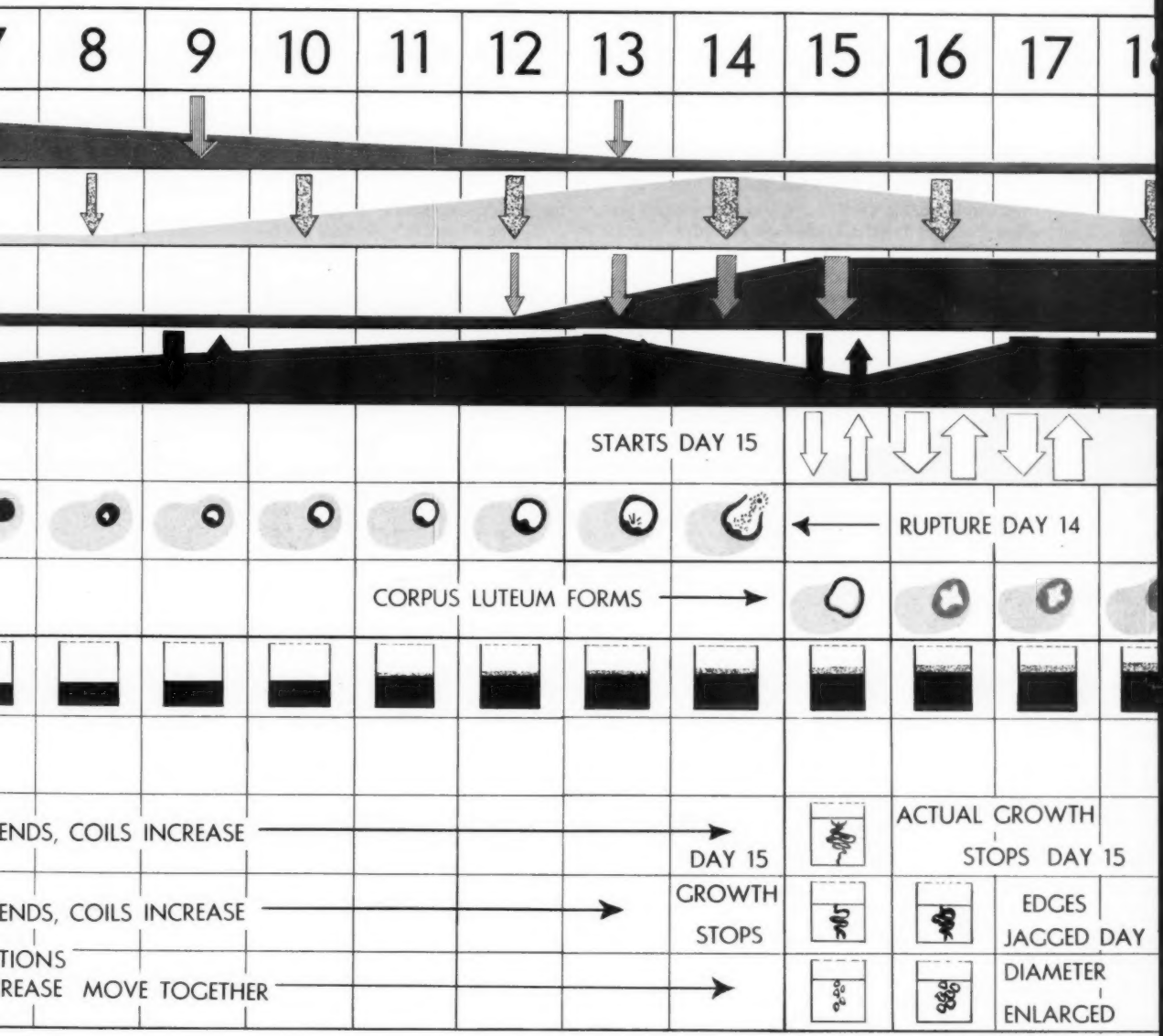

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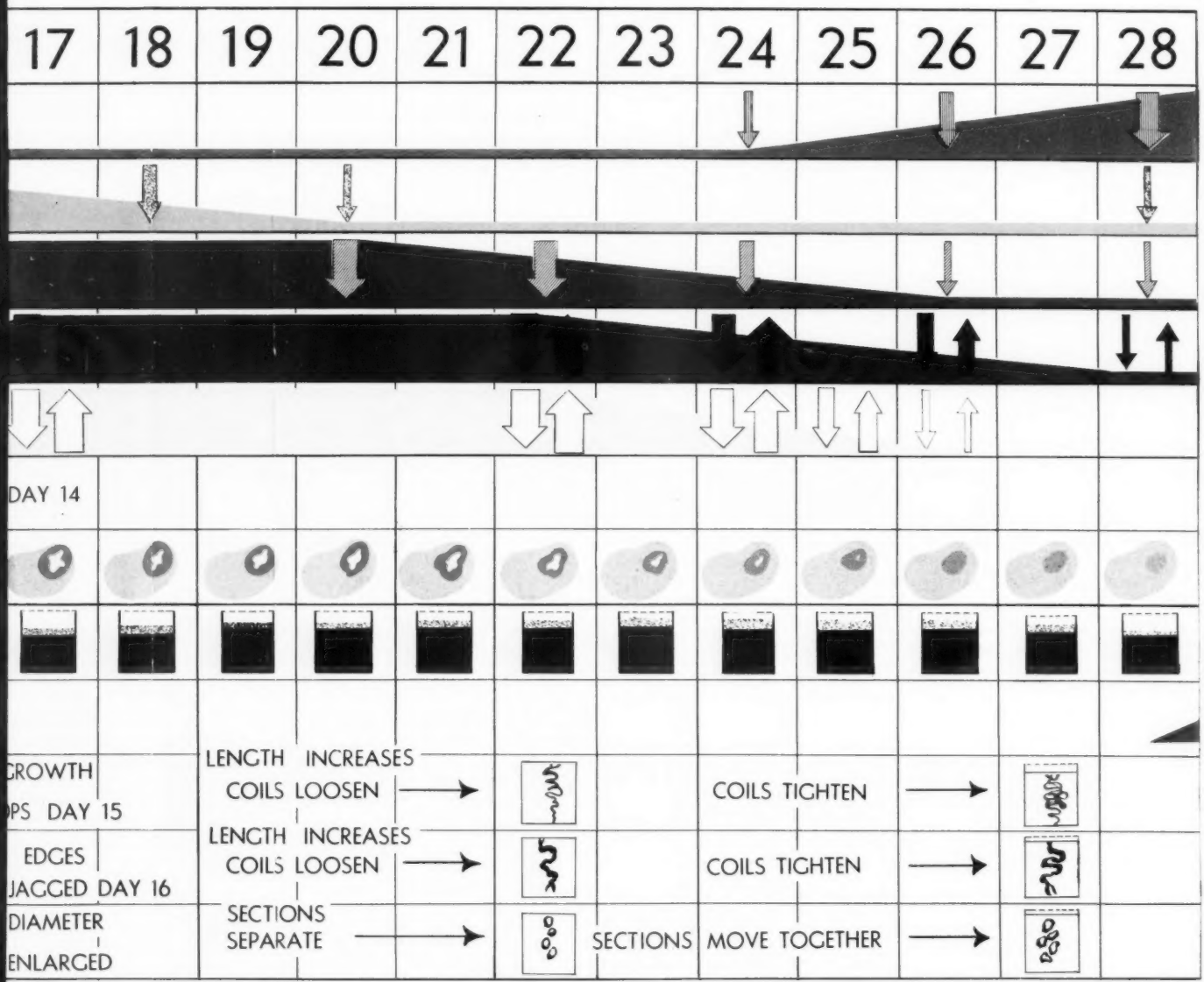

EDITORIALS

THERAPEUTIC USEFULNESS OF POTASSIUM

For centuries physicians have prescribed "strengthening broth" for their convalescent patients. The empiric basis on which it was given has caused some clinicians to scoff at this therapy. Now, however, evidence of a scientific nature, such as that recently presented by Howard and Carey,[1] suggests that the potassium contained in such "essences" may be responsible for much of the benefit which has so long been ascribed to them. It is noteworthy that these Johns Hopkins investigators found that one well-known meat juice preparation contained 1215 mEq. potassium to the liter; 4 tablespoons of such material would contain almost as much potassium as is supplied in an ordinary day's diet.

There is both experimental and clinical evidence of the importance of potassium in metabolism and its usefulness in therapy under certain circumstances. The work in animals has been extensive. For example, rats placed on extremely low potassium diets die within three weeks. In such animals the tissues of the kidneys, skeletal muscles, and heart show greatly reduced quantities of potassium although in the particular studies cited, the liver potassium appeared to be normal. Reduction of potassium in the tissues has also been produced by poisoning with desoxycorticosterone. In experimental animals this can lead to myocardial necrosis.

Howard and Carey summarized the experimental evidence: (1) the organism is incapable of adequately withholding potassium in the face of a prolonged dietary deficiency of this element; (2) that this potassium deficit is accentuated by coincident administration of sodium salts or by desoxycorticosterone; and (3) that reduction of cellular potassium below a certain point is dangerous not only in causing muscular (myocardial) necroses, but that serum potassium is also lowered.

One of the best means of recognizing clinical hypokalemia is through electrocardiography. As serum potassium becomes low, the Q-T interval becomes prolonged. The second change is lowering or inversion of the T waves which is followed, if potassium deficiency persists, by a sagging in the S-T segments. Finally, the take-off of the S-T segments is depressed and a slow, staircase-like rise to a low late T wave occurs. This final stage develops only with an extremely low potassium intake and after passage of some time. In the presence of high serum potassium, the electrocardiogram shows an elevation of the T wave which is followed by decrease in the amplitude of the R wave. The third stage of hyperpotassemia is characterized by auricular arrest and the disappearance of P waves.

Hypokalemia produces a variety of clinical states. Paralytic phenomena have been observed as a result of low serum potassium following the administration of desoxycorticosterone for Addison's disease. In rarer cases the renal mechanism may be disturbed and result in a high output of potassium, thus producing hypokalemia. Probably the most important clinical states leading to low tissue potassium, however, are infantile diarrhea, diabetic acidosis, and the chronic undernourishment, the latter of which may result from debilitating illness or many other factors.

It is believed by Howard and Carey that the administration of potassium as a therapeutic agent is advantageous and sometimes life-saving

[1] Howard, J. E., and Carey, R. A.: The use of potassium in therapy. J. Clin. Endocrinol. 9: 691-713 (August) 1949.

in a variety of clinical disorders. Oral administration is preferred when possible. They recommend a solution of potassium chloride containing from 40 to 80 mEq. of potassium per liter given in 50 to 100 cc. amounts with or without some carrier, such as fruit juice. Meat juice preparations, they say, which also contain a high concentration of potassium are palatable to many.

As these investigators point out, a single element of metabolism such as potassium is only one part of a highly complex interrelated mechanism. Not only does each element involved deserve individual study, but also their interactions in health and disease. Progress in this direction over the past few years has been remarkable. It now seems likely that many aspects of the metabolism of individual elements, their interrelations, and their use in health and disease will become still further advanced in the near future. Among these potassium is sure to play an important role.

E. P. J.

FACTORS IN PREMATURE BIRTH MORTALITY

It has been a generally accepted theory that the major determinant as to whether a premature baby would live is the infant's birth weight. Recent studies have shown, however, that of equal or sometimes greater importance are such factors as the state of the mother's health, the absence of serious obstetric complications, and the method of analgesia and anesthesia employed.

As a result of a study of premature babies made at the Denver General Hospital and the Colorado General Hospital, Drs. E. Stewart Taylor, James R. Phalen, and Harold L. Dyer have reported that ". . . the problem of prematurity for the present time resolves itself into the prevention or control of factors that lead to prematurity, applying the best obstetric methods for delivery of the premature and application of the best known methods for the care of the premature newborn."

The Denver report covered 3,625 deliveries over thirty-one months. There were 477 premature births, the infants weighing between 2.2 and 5.5 pounds, an incidence of 13.2 per cent.

Another study, by Drs. William H. Masters and Robert W. Ross at the St. Louis Maternity Hospital, showed that application of nerve block analgesia and anesthesia has cut the premature infant mortality rate in half at this institution. In this series, there was a 10.7 per cent mortality among prematurely born infants in labors and deliveries carried to completion, using conduction (continuous caudal and saddle block) anesthesia.

This study covered 3,000 patients at the hospital from July 10, 1945 to December 27, 1948 and included 244 premature births.

During the same period there were 6,650 nonconduction cases with the labors and deliveries performed under twilight sleep, inhalation anesthesia, pudendal block, sodium pentothal, or without any analgesia or anesthesia. There were 347 prematures in the series, with a mortality of 20.8 per cent.

The report further stated that conduction anesthesia affords positive protection to the premature infant both during and after delivery "by the alteration in the normal course of labor that inevitably accompanies any method which interferes with the control over labor asserted by the autonomic nervous system." The investigators claim that under conduction anesthesia, the tendencies toward precipitous labors or deliveries disappear.

As proof of the effectiveness of this method, Masters and Ross cite the fact that only 3 out of 244 premature infants who entered labor alive died during the progress of the labor or delivery, or before they could be admitted to the premature nursery. They point to an incidence of 36 deaths in 347 prematures occurring during labor or immediately thereafter when other methods of analgesia were used.

This survey was a cooperative project of the St. Louis Maternity Hospital and the Department of Obstetrics and Pediatrics of Washington University School of Medicine.

In the Denver study, the total fetal mortality

was 16 per cent, including stillbirths and neonatal deaths. The mortality of premature infants from uncomplicated pregnancies and labor was only 8 per cent as compared to 37 per cent when the pregnancy or labor was complicated in some way.

Factors affecting the number of infants born weighing less than 5.5 pounds, as reported by the Denver doctors, included the incidence of pregnancy complications, the number of indigent mothers, and race. They found that although 15 per cent of the clinic patients were Negroes, the incidence of prematures among this group (9 per cent) was less than the general clinic average.

The clinic incidence of toxemia was found to be but 6 per cent, and was not considered to influence the incidence of small babies. Except for less than 2 per cent of patients, obstetric patients in both hospitals (Denver General and Colorado General) are on the ward service, pointing to indigency and all of its implications—incomplete prenatal care, poor housing, and subnormal diet—as prime factors in the high incidence of births below 5.5 pounds.

In support of this view, Taylor, Phalen, and Dyer demonstrated that with normal methods, the fetal mortality of infants weighing from 2.2 to 3.3 pounds was 34 per cent—stillbirth and neonatal—whereas mothers with severe disease lost 70 per cent of their infants in that group. In the 3.3 to 4.4 pound group, losses were 13 per cent and 36 per cent, respectively, while in the 4.4 to 5.5 pound group, the losses were 2 per cent and 22 per cent, respectively.

To combat the problem of premature mortality, a Premature Infant Center has been established at the University of Colorado as a combined training and service project of the Colorado State Health Department and the University, with funds supplied by the United States Children's Bureau.

A. E.

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This special consultation information service is offered as a regular monthly feature of *Postgraduate Medicine*. Readers are invited to call on this Service for answers to difficult medical problems from members of our Editorial Board best qualified to help. Each question will be answered by mail and those of general interest will be published each month. Address all communications to Consultation Service, *Postgraduate Medicine*, 516 Essex Building, Minneapolis 3, Minnesota.

DOSAGE OF GONADOTROPHIC HORMONES

QUESTION: What is the recommended dosage of gonadotrophic hormones of pregnancy urine in cases of incompletely descended testes? Should this therapy ever be started before puberty?

M.D.—Utah

ANSWER: The dosage of gonadotrophic hormones of pregnancy urine recommended for the treatment of incompletely descended testes is a total of 20,000 units. This should be given in doses of 2,000 units two or three times per week. Since the potency of chorionic gonadotrophins decreases rapidly after four to six months, only dated preparations should be used. Therapy should be started before puberty whenever possible and a course of ten to twenty injections should be given. If success is not obtained with the first course a similar course should be repeated at six month to yearly intervals. If descent is not obtained by the age of 14 years, then surgery is indicated. But even after surgery, a course of gonadotrophins should be given to prevent retraction of the testes.

ROBERT B. GREENBLATT

THIOURACIL SENSITIVITY

QUESTION: Is there any test to determine thiouracil sensitivity?

M.D.—New Mexico

ANSWER: Thiouracil sensitivity usually develops during treatment and there is no certain way of testing for it beforehand. In general, patients who have proved to be sensitive to other drugs are more apt to be sensitive to the thiouracil derivatives.

GEORGE CRILE, JR.

ANTIBIOTIC TREATMENT OF RHEUMATOID ARTHRITIS

QUESTION: Have streptomycin, penicillin, or sulfonamides proved effective in the treatment of rheumatoid arthritis?

M.D.—North Dakota

ANSWER: There is not yet reported a sufficient series of cases with satisfactory improvement that would lead to confidence in any of the above therapeutic agents in rheumatoid arthritis. Some observers in a few individual cases have felt that improvement has taken place. However, many rheumatoid arthritics will show short periods of quiescence in their disease. A therapy and the periods of remission may have been coincidental. Their value is definitely questionable.

ROBERT D. SCHROCK

CALCIFEROL IN TREATMENT OF LUPUS VULGARIS

QUESTION: What is the dosage of choice of calciferol for treatment of lupus vulgaris? Is there any danger connected with its use?

M.D.—Iowa

ANSWER: The preferred dose of calciferol in the treatment of lupus vulgaris is 150,000 units per day for a period of four to six months. Doses one-half this size and double this size have been administered successfully. However, the dosage recommended herein represents the most satisfactory compromise between therapeutic effect and toxicity. After a period of several weeks' rest, use of the drug should be resumed a second and again a third time, depending upon the patient's response.

There is definite danger associated with the use of this preparation. The chief hazard entailed in its use is due to the precipitation of calcium in the urine with blockage of the kidney tubules, causing kidney shutdown with uremia. Patients who are under treatment with this drug should have repeated blood urea nitrogen examinations. Any abnormal rise is an indication for cessation of treatment.

Toxic symptoms include amnesia, nausea, vomiting, diarrhea, headache, dizziness, lassitude, loss of weight, and coma. Peripheral neuritis, optic atrophy, hemoptysis, and death have been reported following the use of this drug.

BERTRAM SHAFFER

LEUKOPENIA FOLLOWING SULFONAMIDE THERAPY

QUESTION: What is the treatment for leukopenia that has persisted for a year following the use of sulfonamide drugs?

M.D.—Texas

ANSWER: The fact that leukopenia has existed for a year after discontinuance of the use of sulfonamides is presumptive evidence against their being the causative agent.

There is no specific stimulant to myelopoiesis; however, recovery should follow withdrawal of the offending substance unless the bone marrow has already been irrevocably destroyed. In this instance, careful reevaluation of the patient's present status to exclude the possibility of leukopenic leukemia, lymphoblastoma, hypersplenism, and multiple myelomas might be considered. Studies of the blood and marrow should aid in this regard.

SKIN RASH FOLLOWING GOLD THERAPY

QUESTION: What is the cause of a skin rash following gold therapy for rheumatoid arthritis and what should be done for it?

M.D.—Arizona

ANSWER: The exact cause of the skin rash associated with gold therapy for rheumatoid arthritis is not known. It is definitely not due to an increased content of gold in the skin. The rash, which is almost always pruritic, is thought to be allergic in character, but repeated attempts have failed to demonstrate increased sensitivity to metallic gold. It may be that the sensitivity is to a complex protein gold compound, rather than to the metallic gold. The exact nature of the suspected allergen responsible for gold toxicity is not yet known.

The treatment consists first of all in stopping the administration of gold. If the rash is mild, the administration of antihistaminics, such as Benadryl, and the application of a soothing skin lotion may be all that is required. Direct exposure to sunlight often increases the severity of the rash. If the rash is severe, British anti-Lewisite (BAL) should be used as early as possible in the toxicity. The dosage for severe toxicity is 2.5 milligrams of BAL per kilogram of body weight every four hours for the first forty-eight hours. If the effects are markedly favorable, the frequency of dosage may be reduced to twice daily, and then perhaps to once daily, for eight to ten days.

W. PAUL HOLBROOK

RUPTURED INTERVERTEBRAL DISK

QUESTION: What are the factors in the differential diagnosis of ruptured intervertebral disk and spinal cord tumor?

M.D.—California

ANSWER: Differentiation between an intraspinal neoplasm and a herniated intervertebral disk is often difficult. A history of chronic, progressive, unremitting radiating pain should make one suspicious of an epidural or intradural extramedullary neoplasm. The history of a herniated disk is more often one of chronic recurrent spinal pain and disability with ultimate development of radiating pain and coincident subsidence of the midline pain.

Neurologic findings in herniated disk are limited to the distribution of a *single nerve root* and may include weakness, sensory disturbance, and reflex change in accordance with the innervation by that nerve root. Neurologic findings in the presence of a neoplasm are more widespread than a single nerve root, and if the conus is involved, there may be a sphincter disturbance, hyperactive tendon reflexes, and a sensory level relatively easily found by light pin scratch.

Radiologic examination in some instances of spinal cord neoplasm will reveal widening of interpedicular distances or of intervertebral foraminae, due to pressure by the expanding lesion.

Myelography is usually considered necessary to confirm the diagnosis of intraspinal neoplasm and to locate its level. By many surgeons, myelography is considered essential in the diagnosis of herniated disk. This procedure, however, now is required only in the most questionable cases, since neurologic localization is becoming more accurate.

ALISTER I. FINLAYSON

SWALLOWED COIN

QUESTION: A 4-year-old boy has swallowed a quarter which has remained in the stomach with little change in position for four weeks. No symptoms. How long should one wait and what can be done to remove the coin?

M.D.—New York

ANSWER: A quarter that has remained in the stomach of a boy 4 years old for a period of four weeks should be removed, because of the complications to which it may give rise. It can be removed either by means of gastrotomy or an attempt may be made to remove it under fluoroscopic guidance by means of esophagoscopy.

CRACKING OF JOINTS

QUESTION: A girl, aged 14, who is otherwise in perfect health, shows cracking of the joints whenever she flexes them. She can make her fingers, toes and wrists crack by just bending them. When she does stooping exercises you can hear her cracking all over the room. Is this a sign of disease?

M.D.—Wisconsin

ANSWER: In the light of our present day knowledge, the symptoms this girl has are not indicative of any disease process. At the present time, there is no explanation for this condition.

IMMUNIZING VACCINE IN WHOOPING COUGH

QUESTION: After whooping cough is established in a child of 5 years, does the injection of the usual immunizing vaccine bring about a lessening of the cough or an earlier termination of the disease? If so, what dosages are used?

M.D.—New Jersey

ANSWER: After whooping cough has reached the height of its clinical course, the pertussis vaccine used for immunization purposes does not lessen the cough or shorten the course, so far as is known. The hyperimmune pertussis serum, however, may be useful in this respect. Aureomycin has been demonstrated to have definite therapeutic value in whooping cough also.

IRVINE MC QUARRIE

New Drugs *and* Instruments

Information published in this department has been supplied by the manufacturers of the products described.

BOLSEY PORTABLE MICROFILMER

DESCRIPTION: The unit contains camera, lights, reader, stand, and accessories in a single case. The camera, a special model of the Bolsey B miniature camera, may be used separately for color slides or black and white negatives. Flash equipment is available.

The microfilmer covers a field of approximately 9 by 14 inches; larger fields may be covered by reversing the position of arm and supplying supplementary lighting.

A separate head is furnished for reading purposes, the image being restored to original size by projection on the base, or, if larger images are desired, the reader-head may be rotated for projection of the image on a wall or screen to a size two or three times the original.

The camera uses standard 35 mm. film cartridges.

DISTRIBUTOR: Migel Distributing Co., Inc., New York, N.Y.

MACRON

PURPOSE: Treatment of secondary and nutritional anemias.

COMPOSITION: Each tablet represents:

Ferrous sulfate U.S.P.	0.35 gm.
Thiamine hydrochloride	2 mg.
Riboflavin	2 mg.
Nicotinamide	10 mg.
Pyridoxine hydrochloride	1 mg.
Pantothenic acid (as calcium pantothenate)	2 mg.
Ascorbic acid	50 mg.
Liver concentrate	0.5 gm.

INDICATIONS FOR USE: For microcytic and macrocytic anemias which should be expected to benefit by the nutritional factors incorporated with the iron. Macron is not recommended as a treatment for pernicious anemia, but may be used as an adjunct to liver injection.

DOSAGE AND ADMINISTRATION: Three Macron tablets daily is the average adult therapeutic dose.

HOW SUPPLIED: Bottles of 100, 500, and 1,000 tablets.

PRODUCER: Abbott Laboratories, North Chicago, Ill.

TRICOMBISUL

PURPOSE: Indicated when oral systemic sulfonamide therapy with sulfacetimide, sulfadiazine, or sulfamerazine alone would be used.

COMPOSITION: Each tablet contains 0.166 gm. sulfacetimide, 0.166 gm. sulfadiazine, and 0.166 gm. sulfamerazine, a combined sulfonamide content of 0.5 gm.

DOSAGE AND ADMINISTRATION: Adults—4 gm. (8 tablets) as initial dose, followed by 1 gm. (2 tablets) every four hours, day and night, until temperature, pulse and respiration have been normal for forty-eight hours; 3 or 4 gm. may then be given in divided doses for two to three days more, depending on the type and severity of the infection. Children—average daily dose is 0.2 gm. per kilogram of body weight. On the first day one-third of this dose is given as initial dose, followed by one-sixth the total daily dose at four-hour intervals, until temperature, pulse and respiration are normal for at least thirty-six hours; dose may then be reduced to two-thirds or one-half original maintenance dose for two to three days, depending on the infection.

HOW SUPPLIED: Tablets, 0.5 gm. each, bottles of 100 and 1,000.

PRODUCER: Schering Corporation, Bloomfield, N.J.

ARTANE

PURPOSE: Antispasmodic for treatment of parkinsonism in arteriosclerotic and postencephalitic types.

DOSAGE AND ADMINISTRATION: Artane should be given orally at meals. As initial therapy, 2 mg. the first day, increased by 2 mg. daily until 6 to 10 mg. daily are given, divided into 3 doses per day with meals. If a fourth dose is required, it may be given at bedtime. Some postencephalitic patients may require 12 to 15 mg. daily.

CAUTION: When nausea or blurred vision occurs the drug should be discontinued temporarily for several days and then resumed at a lower level. Careful observation of patients is indicated.

HOW SUPPLIED: Bottles of 100 and 1,000 tablets (2 mg. or 5 mg. each scored tablet).

PRODUCER: Lederle Laboratories Division, American Cyanamid Company, Pearl River, N.Y.

INCREASE IN LIFE AND POWER OUTPUT OF STERILAMP

DESCRIPTION: Changes apply to types WL-782L-30, WL-782H-30, and WL-782H-10 Sterilamps. Rated life is increased from 9,000 to 12,000 hours of operation. Increased output results primarily from an increase in the current rating of the ST-70 transformer used in conjunction with the Cold Cathode lamps. Now rated at 55 milliamperes, the transformer makes possible an increase of 15 per cent in amount of ultraviolet radiation.

PRODUCER: Westinghouse Lamp Division, Bloomfield, N.J.

GELFOAM* TUMOR DIAGNOSIS KIT

DESCRIPTION: Each kit contains two sterile Gelfoam biopsy swabs and one 30 cc. bottle of fixative solution (Formaldehyde Solution, U.S.P., 1:10). A mailing carton and gummed address label are furnished to facilitate sending the specimen to the pathologist.

The kit was developed to facilitate diagnosis of cancer in accessible regions of the body such as lesions of the skin, mouth, bronchi, lower bowel, cervix, and uterus.

In carrying out the sponge biopsy technic, the Gelfoam swab is clamped along one margin by a surgical sponge forceps. The ulcer is wiped clean with dry sterile gauze and the dry Gelfoam sponge is rubbed gently over the area. After the sponge becomes wet, it is pressed more firmly against the lesion with slight rubbing. The cells will adhere to the sponge surface. The sponge is then placed in the formaldehyde fixing solution and sent to the laboratory, where the cells adhering to the Gelfoam are examined microscopically and identified.

PRODUCER: The Upjohn Company, Kalamazoo, Mich.

*Trademark, Reg. U. S. Pat. Off.

ANACAP SURGICAL SILK

DESCRIPTION: For those who prepare and sterilize their own silk sutures, Anacap surgical silk is now available on spools, unsterilized, in lengths of 25 and 100 yards and sizes 6-0 to 5. The spools are packaged in a transparent, plastic container which protects the silk from dust and dirt. Anacap silk may be readily sterilized by boiling or autoclaving.

PRODUCER: Davis & Geck, Inc., Brooklyn, N.Y.

BENZEDREX INHALER

PURPOSE: To relieve congestion of head colds, allergic rhinitis, and sinusitis.

DESCRIPTION: Replaces the Benzedrine Inhaler (S.K.F.). Each Benzedrex Inhaler is packed with 1-cyclohexyl-2-methylaminopropane, S.K.F., 250 mg. and aromatics.

DOSAGE AND ADMINISTRATION: May be used as often as desired, but once an hour is usually sufficient.

HOW SUPPLIED: In single plastic tubes.

PRODUCER: Smith, Kline & French Laboratories, Philadelphia, Pa.

NUTRI-BEE

PURPOSE: For the prevention and treatment of B vitamin deficiencies.

COMPOSITION: Each capsule contains:

Thiamine hydrochloride (B_1)	10 mg.
Riboflavin (B_2)	10 mg.
Pyridoxine hydrochloride (B_6)	5 mg.
Folic acid	2 mg.
Niacinamide	50 mg.
Calcium pantothenate	25 mg.
Liver fraction	200 mg.
Stomach concentrate	200 mg.

DOSAGE AND ADMINISTRATION: Orally, 2 capsules daily, or as directed by physician.

HOW SUPPLIED: Bottles of 100 capsules.

PRODUCER: American Pharmaceutical Co., New York, N.Y.

COLEMAN PHOTO-ELECTRIC COLORIMETER
Model 8

DESCRIPTION: Features of the instrument are: (1) scale panel calibrated in both transmission and density, and removable for insertion of other panels conveniently calibrated by the analyst to read directly for any particular analysis; (2) specially selected filters covering visible spectrum in six uniform increments of spectral purity; (3) selection of cuvettes from 25 mm. depth to capillary size; (4) a photocell operating at extremely low sensitive levels insuring better linearity, freedom from cell fatigue and accompanying drift. Additional information available from:

PRODUCER: E. Machlett & Son, 220 East 23rd St., New York 10, N.Y.

ANTISTINE-PRIVINE

PURPOSE: Nasal decongestant.

COMPOSITION: Antistine hydrochloride 0.5 per cent and privine hydrochloride 0.025 per cent in an aqueous solution buffered at a *p*H of 6.1.

INDICATIONS FOR USE: In sinusitis, the common cold, allergic rhinitis, vasomotor rhinitis.

DOSAGE AND ADMINISTRATION: Two to three drops in each nostril every three to four hours.

HOW SUPPLIED: Bottles of 1 ounce with dropper.

PRODUCER: Ciba Pharmaceutical Products, Inc., Summit, N.J.

SPECIAL PURPOSE SURGEONS' GLOVES

DESCRIPTION: Designed to eliminate dermatitis in a number of cases where the irritation has been caused by wearing rubber gloves of standard types.

PRODUCER: The B. F. Goodrich Company, Akron, Ohio.

SPRINGLESS WHEELCHAIR

DESCRIPTION: A wheelchair without springs but with complete shock absorption and smooth riding qualities. A tubular steel frame is formed in an elleptisoid from which the seat is suspended. Arm rests are mounted on top section of frame and bottom section is attached to wheelchair chassis. A feature of this chair is the automatic adjustment to body positions, in which the back automatically adjusts itself depending upon whether the patient wishes to sit up straight, recline, or rest in a completely supine position. It may be securely locked at any point. Standard equipment includes individually adjustable leg rests. Footboards fold and adjust to three lengths. Equipped with rubber grip handbrake.

PRODUCER: Gendron Wheel Company, Perrysburg, O.

SULFAMYLON HYDROCHLORIDE WITH STREPTOMYCIN SULFATE

PURPOSE: Antibacterial.

COMPOSITION: Sulfamylon is 4-aminomethylbenzenesulfonamide hydrochloride.

INDICATIONS FOR USE: For topical chemotherapy of surgical and traumatic wounds, localized infections such as otitis media, sinusitis, vaginitis, osteomyelitis, and infected burns. Also for prophylactic application during operations where contamination of the surgical field is believed to have occurred.

PREPARATION OF SOLUTION: Withdraw several cc. of Sulfamylon solution into a sterile syringe and transfer to bottle containing streptomycin sulfate powder. After the powder has dissolved, withdraw resulting solution and transfer back to the Sulfamylon bottle. Sterile precautions should be observed. Mix by shaking thoroughly. When mixed, each cc. contains Sulfamylon hydrochloride 5 per cent and not less than 200 units streptomycin.

DOSAGE AND ADMINISTRATION: Wounds—direct application by sponging, irrigation or wet dressings. Otitis media—instillation of from 0.25 to 0.5 cc. into external auditory canal every other day for from four days to four weeks. Mastoidectomy—instillation, irrigation, or wet dressings after mastoidectomy. Sinusitis—Nebulization, nasal tampon or by displacement.

HOW SUPPLIED: Combination package of rubber-capped vial containing 100 cc. of Sulfamylon solution 5 per cent and rubber-capped vial of streptomycin sulfate 20,000 units.

PRODUCER: Winthrop-Stearns, Inc., New York, N.Y.

FEROMA CAPSULES

PURPOSE: Treatment of secondary anemias.

COMPOSITION: Feroma Capsules contain ferrous sulfate exsiccated, 0.2 gm. (3 gr.) and glutamic acid hydrochloride, 0.3 gm. (5 gr.).

DESCRIPTION: Glutamic acid hydrochloride causes free acid in the stomach, aiding absorption and assimilation; this results in formation of hemoglobin in the body. Ferrous sulfate is included because soluble ferrous salts are the most easily absorbed and assimilated.

INDICATIONS FOR USE: Various types of secondary anemia characterized by a deficiency of hydrochloric acid in the gastric secretion. In treatment of anemias occurring in the higher age groups and during pregnancy.

DOSAGE AND ADMINISTRATION: Recommended dosage is one capsule three times daily with each meal.

HOW SUPPLIED: Bottles of 100 and 1,000.

PRODUCER: Sharp & Dohme, Inc., Philadelphia, Pa.

NISULFAZOLE

PURPOSE: Adjunctive treatment in nonspecific chronic ulcerative colitis and proctitis, and as a pre- and postoperative aid in anorectal surgery complicating ulcerative colitis.

DESCRIPTION: A modified sulfonamide compound, paranitrosulfathiazole, supplied in the form of a suspension.

DOSAGE AND ADMINISTRATION: The suspension is given as a retention enema by means of a soft rubber catheter attached to a syringe. The usual beginning dose is 10 cc. after each stool and at bedtime. An alternative dosage is 30 to 60 cc. four times daily. It is advisable to continue instillations of 15 to 30 cc. once daily for four to six weeks after the mucosa appears normal under sigmoidoscopic examination.

HOW SUPPLIED: Bottles of 296 cc. (10 fluid ounces).

PRODUCER: George A. Breon & Company, Kansas City, Mo.

VIBEX

PURPOSE: Administration of the B complex group of vitamins in liquid form.

COMPOSITION: Each fluidounce contains:

Vitamin B_1	12 mg.
Vitamin B_2	24 mg.
Vitamin B_6	6 mg.
Nicotinamide	120 mg.
Pantothenic acid	12 mg.

INDICATIONS FOR USE: Pregnancy and lactation, convalescence, and as an adjunct to other vitamins.

DOSAGE AND ADMINISTRATION: May be added to orange juice, milk, water, or formulas.

HOW SUPPLIED: In 4 ounce bottles.

PRODUCER: Parke, Davis & Co., Detroit 32, Mich.

Leaves from a Doctor's Diary

By Maurice Chideckel

October 2 . . . Myelitis in John Stone's lumbar region was complicated by priapism. Mrs. Stone ran around the neighborhood and whispered the secret to each woman. The women laughed and gossiped and some of the jokes were vulgar. Mrs. Garfield stealthily entered my office. "What causes it?" she asked. In her own language I told her that hydrophobia, tetanus, leukemia, alcoholism are common causes. It did not seem to satisfy her inquisitiveness. I began to recite some more causes. "A stone in the bladder will—." She sprang to her feet. "Quick, tell me, doctor, how do I put the stone in there?"

* * *

October 5 . . . Sometimes after a hard day's practice, I think of the paradoxes, the errors, the absurdities of human motives. I think of the science of positive eugenics, the promotion of reproduction by the best stock, the efforts of which have proved futile so far, and of negative eugenics, the prevention of reproduction of bad stock, which have equally failed to materialize, and of the great Huxley, who stated that man is seldom taken advantage of. Man does shape his own destiny, does mould his own future, but how? And I think of the little things in life that unite and disrupt, that unite and scatter, make and break, fuse and dissolve. At least, I think.

Little things. John Paul and Steward Parker had a nodding acquaintance. Said Paul to Parker: "I have a date tonight with a fine dame. Yes, yes, I know a married man should keep no dates. But she is married too." Said Parker to Paul: "Is she good-looking?" Paul: "Sure is. Look, I have her picture." An exclamation of pained surprise. Parker's estranged wife. Then an hour later they were brought to my office.

Paul had a complete fracture in the upper third of the shaft of the humerus; the upper fragment apparently was pulled inward by the pectoralis major muscle and the lower upward by the deltoid. There were also numerous lacerations of face and arms. Parker had a fracture of both head and neck of the humerus, and both were impacted.

"They were killing each other with chairs," the one who brought them told me. "Why," I asked, "didn't you do something?" "There were only two chairs in the room," was his explanation.

And Eva Brack, a fine, cultured girl, a college senior, but with a sordid background, for her parents are contradictory personalities with closed minds. The thirty years of their married life they spent in quarreling, abusing and cursing. One day Eva laughed at something, and laughing she fainted and became unconscious for several minutes. She came to consult me a few days later, picked up a book of humorous tales, burst out laughing, and in the midst of her laughter she fainted, and then went to sleep.

I encounter cases of narcolepsy frequently, but this is the first case I have had of probable catalepsy with narcolepsy, though I did come across such cases in the literature. Probably a lesion in the corpora striata. I placed the young woman in the hospital for observation. Benzedrine and potassium chloride proved highly beneficial. I went to her home to talk her case over with her father and mother. The father, by the way, recently underwent a prostatectomy.

Loud and angry, the mother spoke: "Some husband. Just like a shoe. Takes a long time to make the foot feel comfortable. By that time it's so old it's useless. So are you."

He tried to drown her voice by screaming: "You need twice as much face powder as any other woman. Why? Because you are double faced. Ha, ha, ha. The only cooking you know is how to make me boil."

My entrance did not interrupt the battle. "Stop your foolishness," I told them. Both looked bewildered. Then he approached me menacingly. She too folded her arms and looked far from pleasant. "Can't even fight in peace," he exclaimed. As she nodded assent, I quickly withdrew. Not one word mentioned about their daughter.

* * *

October 12 . . . The gallant lost his glitter. The famous criminal lawyer in the person of L. H., after successfully defending the man accused of rape and murder collapsed in the courtroom. From the summit of success he suddenly attained the apogee of failure, physical, mental and also, as time went on, financial. The victim was a distant relative of the lawyer.

The man charged with the crime was seen entering her apartment that night, and hours later, a man with hat over his eyes was seen leaving her apartment hurriedly. The description tallied with that

of the accused. Lawyer and defendant are of the same stature. In the morning the crime was discovered.

The attorney refused to enter a hospital for observation. His mind at times became a jumble of strange and paradoxical thoughts, and often he spoke incoherently. Two weeks ago he was a full fledged case of parkinsonism. Scopolamine hydrochloride revealed a terrible secret. He was evidently allergic to the drug. He developed hallucinations and delusions and in the midst of his mental confusion, he stretched out his arms to embrace the murdered girl, called her by name, stopped talking, and before I could come to his aid he expired. In his room after a diligent search they found a full confession of the revolting crime written soon after its commission.

Stories based on truth are seldom issued because, as one publisher once told me, truth sounds fictitious. So does this tale of horror, factual though it is.

* * *

October 13 . . . I was summoned to Bill Hart in the dead of night. Reason: Acute alcoholism. "Is he drunk again?" I asked. "Well," spoke his wife trembling, "he is quite inebriated." There was the muscular incoordination affecting all extremities. He was alternately sullen and morose, noisy and boisterous. I found his wife kneeling and praying. "Oh, Lord, pity my poor drunken husband." He suddenly sprang to his feet and then fell down again. He screamed coherently: "Did you have to tell the Lord that I am drunk? Now you spoiled the whole business. He'll never listen."

To seek refuge in the bottle. They say that moderate doses decrease the sense of fatigue and give the individual a sense of jollity. The American citizen under the influence of fire water I saw in the telephone booth in the same building, must have imbibed a little more than a moderate dose. He smiled sheepishly and spoke in spurts. "Operator, you are swell. Here is something for you," and he threw in four quarters as a tip for the telephone operator.

An old patient of mine, once crusading for social reform, was suddenly deserted by his wife. He took to drink, grew shabby, and went to seed. A year later I saw him pushing a chair on the boardwalk with two passengers in it. I saw him taking a sip from a bottle every now and then. I followed him. After the tenth drink he stopped the chair, told the passengers to get out, went into the chair and ordered them to push him.

* * *

October 18 . . . Psychoneurosis in the form of hysteria mounted the throne, four in one week; all four are nice ladies with no antisocial and no destructive tendencies. There are the typical contractures in Rosalie Bogart, because her husband of hammy pomposity with bullfrog features refuses to divulge the source of lipstick on his collar and neck; hysterical convulsion in Harriet Janeway because she married an elderly man for love and discovered that he has not a cent; the emotional conflict in Beatrice Ebaugh eventuated into aphonia. After practicing birth control for years, dreading pregnancy she was informed that she will never become a mother because of an infantile uterus. The craving for motherhood now defies description.

But the one whose case is most interesting and who deserves sympathy is that of Roberta Donalds, whose husband, a lawyer, made a large splash in the legal world by his ability to prove the innocence of those accused of robbery. His cogent argumentation makes even the guilty defendants convinced of their innocence. Roberta at first went blind. Psychologists claim that hysterical blindness is due to a conflict between the craving to see the forbidden, and the force of morality. To solve the problem the individual gets blind, so she cannot long to see. It doesn't make much sense to a mere general practitioner.

Cause of hysteria: Mr. Donalds was defending a young man caught in the act of robbery at pistol point. This was a case in which he could not claim innocence. So the attorney began to trace the unfortunate surroundings of the unfortunate boy. A drunken father (the boy was illegitimate and the mother couldn't tell who the father was; then again, maybe he was a drunk), the mother's criminal neglect, and the logical development of the inevitability of the boy's association with thugs. But he promises the jury that the young man will go on the path of righteousness. He was given the guardianship of the accused and he guaranteed his behavior. That was four days ago.

The defendant, 16, was placed in his custody. A position was obtained for him and he was given money enough to last until he gets his salary. The same night a masked bandit with gun in hand broke into the house of attorney Donalds while he was away. Mrs. Donalds was fast asleep, but awakened when the drawers were being rifled. Her screams made the intruder flee. He was caught by neighbors as he opened the door. The same poor boy, driven by circumstances to crime. Now, what?

Thus in my practice of medicine I encounter the pathos of incorrigible lives, the drunken taunts of the inebriated, men of genuine gallantry who can resolutely shoulder their way out of the most wretched environment, multiminded people and people with minds closed, or no minds at all, those who keep aloof from conflicts and those who are not happy unless they have something to grieve about. Such is the dance of life. No two humans with the same mental equipment. Despair always vying with lusty lives.